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AN OVERVIEW ON CHARAKOKTA BHESHAJ PARIKSHA VIDHI W.S.R TO ADULTERATION AND SUBSTITUTION

Vidyavati V. Hiremath[1] and Avinash Bholane[2]*

[1]Consultant (Ayurveda) NCISM, New Delhi.

[2]Associate Professor, Aarihant Ayurvedic Medical College, Gandhinagar, Gujarat, India.

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***Corresponding Author**
Dr. Avinash Bholane
Assistant Professor, Aarihant Ayurvedic Medical College, Gandhinagar, Gujarat, India.

ABSTRACT

The present article deals with the concept of *Dravya Pariksha Vidhi* explained by *Acharya Charak* and their challenges like Adulteration, Substitution & Modern Guidelines of standardization of drugs etc. Which plays an important role in the identification, authentication, and yielding of good quality of required drugs along with preserving the natural resources. In 20th and 21th - century people become aware of the challenges of synthetic drugs, which made the world shift towards Ayurveda that result in more usage of Ayurvedic medicines, which created an increased demand for raw material. So to fulfil the demand the fast drop-off started in the natural resource. Plants growing in high altitude regions, many of them became endangered and rare, as well as costly. Some drugs like *Vatsnabh* (*Aconitum Chasmanthum* stapfex. Haimes), *Kutki* (*Picrorhiza kurroa* Royle ex Benth), *Kustha* (*Saussurea lappa* C.B.Clarke), *Riddhi* (*Hobenariainte media* D. Don), *Vriddhi* (*Habenariaedge worthii* Hook.f.ex.Collett), *Kakoli* (*Roseea purpurrea* Smith), *Kshirakakoli* (*Lilium polyphyllum* D. Don), *Jeevaka* (*Crepipiuma cumina* tum D. Don. Szlach.), *Meda* (*Polygonatum verticillatum* Linn.) Allioni), *Mahameda* (*Polygonatum cirrhifolium* (wall.) Royal) and (*Polygonatum Vertecillatum* Alloi), *Rakta Chandana*, *Sandal Surkh* (*Pterocarpus santalinus* Linn.), *Sweta Chandana* (*Santalum album* Linn.), *Kesar*(*Crocus sativus* Linn.) *etc*. completely entered the endangered zone and due to incorrect identification, collection intentionally or unintentionally, Herbal adulteration has become common malpractices in herbal raw material trade. Due to the addition of spurious drugs, faith in Ayurvedic medicines for their results has declined. So, it is a need of the hour for proper identification of drugs through standardization techniques along with preserving our natural resources. As well as to overcome these problems the Knowledge of *Vrikshayurved* is

also essential to get the better yield of the requirement along with proper plant care to fulfil the required needs genuinely. The biggest advantage of applying these methods is that we could find *Anukta dravya* (Extrapharmacopieal) new drugs, *Pratinidhi dravya* (Substitute) and help to find out the properties (Raspanchak, Exact pharmacological action) of adulterated drugs in the view of *Ayurveda*, like *Rasapanchaka, Guna, Karma, Prabhav*, etc. and thus, facilitate its use in Ayurvedic therapeutics.

INTRODUCTION

Ayurveda which literally means "The science of Life" is one of the most ancient medical sciences of the world. *Ayurveda* advocate a complete promotive, preventive and curative system of medicines. For achieving these benefits of *Ayurveda* four limbs of treatment are described and known as *Chikitsa Chatushpad*.

Among those *Chatushpaad Bheshaj/Dravya* is recognized as an important tool which should be known by *Bhishak* in treatment aspects. Hence it is known as *Bheshaj*. *Bheshaj* is essential in case of *Dravyabhut Yuktivyapashray Chikitsa*. *Aacharyas of Ayurved* gives importance to this because success of treatment depends on this factor, without this *Bhishak* is unable to treat patient.

Another example of importance given to *Bheshaj* is the concept of *Trisutra. Aacharya Charak* explained the concept of *Trisutra* i.e. *Hetu sutra, Linga Sutra* and *Aushad Sutra*. By this we understand how much *Dravya* is important to *Ayurved*.

In the current era the proper results are not achieved in *Dravyabhut chikitsa* due to more adulteration and substitution either intentionally or unintentionally or due to lack of medicine.

Hence standardisation of *Dravya* and adding of new drugs in *Ayurved* is a need of present situation, before use of drug the addition of new drug can be done by concept of *Bheshaj Pariksha Vidhi* of *Charak Samhita*.

Acharyas of *Ayurveda* have allowed the skilful use of similar *Dravyas* which are not explained by them in case of non-availability of the one mentioned in the text. Thus, in *Nighantu* period followed this concept and studied new drugs and explained them in their text. Thus, many drugs from other healthcare systems or which were not found in India were later assimilated in *Ayurveda*.

This has led to new additions. For example, *Aakarkarabh* and *Kumari* were originally from African region; *Chandrashur* and *Madyantika* were from Faras region (now Egypt) but we find their references as well as elaborate description in Classical texts of *Ayurveda*.

Thus, following this tradition, we must find out such commonly used as well as a folk medicine, which do not have mention in *Ayurvedic Samhitas*. Such time-tested drugs are needed to be studied by *Dravyaguna* researchers. In *Ayurveda*, this can be attained with the help *Dravya Pariksha Vidhi* in *Vimansthana* of *Charaka-Samhita*.

AIMS AND OBJECTIVES

- This article aims at proper understanding the concept of *Dravya Pariksha Vidhi*.
- The study is carried out with an aim to understand it thoroughly and find its applicability for standardization of adulterants and substitutes of drugs.
- Applicability for finding new drugs which can be used for *Chikitsa*.

MATERIALS AND METHODS

The study was carried out after studying Classical text like *Charak Samhita*, *Sushrut Samhita, Bhavprakash Nighantu*, various textbooks of *Dravyagun Vigyan* and online medical database and published research papers etc. related to the concept of Adulteration, Substitution and *Dravya Pariksha Vidhi*.

Concept of adulteration[1,2]

Adulteration it is a practice of substituting the original crude drug partially or fully with other substances which is either free from or inferior in therapeutic and chemical properties or addition of low grade or spoiled drugs or entirely different drug similar to that of original drug substituted with an intention of enhancement of profits.

1. **Types of adulterants**

1.1 Substitution with substandard commercial varieties: Adulterants resemble the original crude drug morphologically, chemically, therapeutically but are sub-standard in nature and cheaper in cost. E.g. Strychnos nux vomica seeds are adulterated with Strychnos nux-blanda or Strychnos potatorium seed.

1.2 Substitution with superficially similar but inferior drugs: Inferior drugs may or may not have any chemical or therapeutic value. They may resemble only morphologically, so due to its resemblance they are used as adulterants. Eg. Cloves with mother cloves.

1.3 Substitution with artificially manufactured substance: The drug is adulterated with the substance which has been prepared artificially. The artificially manufactured substance resembles the original drug. E.g. paraffin wax is adulterated with yellow bee wax.

1.4 Substitution with exhausted drug: The same drug is admixed but that drug is devoid of medicinally active substance as it has been extracted already. Mainly volatile oil containing drugs like clove, coriander, fennel, caraway are adulterated by this method.

1.5 Substitution with synthetic chemicals to enhance natural character: Synthetic chemicals are used to enhance natural character of the exhausted drug. Examples: citral is added to citrus oils like lemon and orange oils.

1.6 Presence of vegetative matter of same plant: Some miniature plants growing along with the medicinal plants are added due to their colour, odour, and constituents.

1.7 Harmful adulterants: Some are harmful materials as the adulterant, are collected from market waste materials and admixed with the drug. It is done for the liquid drugs.

1.8 Adulteration of powders: The drugs which are in the form of powders are frequently adulterated. Examples: dextrin is added in ipecacuanha, exhausted ginger in ginger, red sanders wood in capsicum powder and powdered bark adulterated with brick powder.

2. Reason of adulteration

2.1 Confusion in vernacular names: In *Ayurveda*, *Parpatta* refers to Fumaria parviflora Lam. In *Siddha*, *'Parpadagam'* refers to Mollugo pentaphylla L. Owing to the similarity in the names in traditional systems of medicine, these two herbs are often interchanged or adulterated or substituted.

2.2 Lack of knowledge about authentic source: *Nagakesar* is one of the important drugs in *Ayurveda*. The authentic source is Mesua ferrea L. However, market samples are adulterated with flowers of Calophyllum inophyllum Linn. Though the authentic plant is available in plenty throughout the Western Ghats and parts of Himalayas, suppliers are unaware of it. There may also be some restrictions in forest collection. Due to these reasons, C. inophyllum Linn. (Which is in the plains) is sold as *Nagakesar*.

2.3 Similarity in morphology: Mucuna pruriens (L.) DC. is adulterated with other similar Papilionaceae seeds having similarity in morphology. M. utilis (Ridl.) H.J.Lam (sold as white variety) and M. deeringiana (sold as bigger variety) are popular adulterants. Apart from this M. cochinchinensis (Lour.) Spreng., Canavalia virosa (Roxb.) Wight & Arn. and C. ensiformis (L.) DC. are also sold in Indian markets..

2.4 Lack of authentic plant: Hypericum perforatum L. is cultivated and sold in European markets. In India, availability of this species is very limited. However, the abundant Indo-Nepal species H. patulum, sold in the name of H. perforatum L. Market sample is a whole plant with flowers and it is easy to identify them taxonomically. Anatomically, transverse section of H. perforatum L. stem has compressed thin phloem, hollow pith and absence of calcium oxalate crystals. Whereas H. patulum has broader phloem, partially hollow pith and presence of calcium oxalate crystals.

2.5 Similarity in colour: It is well known that with course of time, drug materials get changed to or substituted with other plant species. *'Ratanjot'* is a recent day example. According to the suppliers and non-timer forest product (NTFP) contractors, in the past, roots of Ventilago madraspatana Gaertn. were collected from Western Ghats, as the only source *'Ratanjot'*. However, that has not been practiced now. It is clearly known that Arnebia euchroma (Royle) I.M.Johnst is the present source. Similarity is in yielding a red dye, A. euchroma (Royle) I.M. Johnst substitutes V. madraspatana Gaertn. Recently V. madraspatana Gaertn is not found in market. Whatever is available in the market, in the name of *Ratanjot* is originated from A. euchroma (Royle) I.M. Johnst.

2.6 Careless collection: Some of the herbal adulterations are due to the carelessness of herbal collectors and suppliers. Parmelia perlata (Huds.) Ach. is used in *Ayurveda*, *Unani* and *Siddha*. It is also used as grocery. Market samples showed it to be admixed with other species (P. perforate Bory.).

3. Concept of Substitution

Substitution is a replacement of equivalent drugs in place of original drugs on the basis of similar pharmacological actions and therapeutic uses. In Ayurveda, substitution is described by the name of Abhava Pratinidhi Dravya. During Samhita Period concept of adulteration and substitution was not existed but later on this practice come in existence. But Vagbhatta has mentioned that the dravya having similar Ras (taste), Guna(characteristic), Veerya (potency) and Vipaka should be used in absence of each other. So Abhava Pratinidhi Dravya is a replacement of original drug basically having similar Rasa, Guna, Veerya, Vipak and mostly on Karma. Description of Abahva Pratinidhi Dravyas are mentioned in Bhavaprakash Nighantu, Yogratnakar and Bhaishajya-Ratnawali.17-19 There are 47 drugs of plant origin (Sthavar Dravya), 2 drugs of animal origin (Jangam Dravya), 7 drugs Minerals-Metals origin (Bhoumya Dravya) and 5 food materials (Ahara Dravya) mentioned for Abhava Pratinidhi Dravya in Bhavaprakash Nighantu.[3]

4. Types of substitution[4]

4.1 Using totally different drug: *Bharangi* (Clerodendrum indicum L. Kuntze.) and *Kantakari*. *Bharangi* has bitter taste; *laghu* (light*), ruksha* (unctuous) *guna* (quality) and has *Kapha-vatahara* property. While *Kantakari* (Solanum xanthocarpam) has *katu vipaka* (pungent digestion) and *ushna virya* (hot potency). Both C. indicum L. Kuntze and S. xanthocarpam have shown antihistaminic activity. Both C. indicum L. Kuntze and S. xanthocarpam are commonly used in the diseases related to the respiratory system, which are usually associated with release of histamines and other autacoids.

4.2 Substitution of the species belonging to same family: The Datura metal L. and Datura stramonium L. can be considered here. Chemical constituents are alkaloids, scopalamine, atropin, hyocyamin, lyoscine. The alkaloids are proved as bronchodialatory and inhibitor of secretion of mucous membrane. The alcoholic extract of D. metal L. shows anthelmentic 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, as far as the diseases of the respiratory tract are concerned both D. metal L. and D. stramonium L. are beneficial, while as D. metal L. would be a better choice as it is a proven anthelmintic.

4.3 Using different species: Two types of *Gokshura* viz. Tribulus terrestris L. (Zygophylaceae) and Pedalium murex Linn. (Pedaliaceae) of which, T. terrestris L. has the chemical constituents like chlorogenin, diosgenin, rutin, rhamnose and alkaloids. While P.murex L. has sitosterol, ursolic acid, vanilin, flavonoids and alkaloids. Both the species are proved for nephroprotective, lithotriptic, diuretic and hepatoprotective activities. The clinical conditions where Gokshura is indicated i.e. *Mutrakrucchahara* (renal disorder), *Ashmarihar* (urinary calculi), *Prameha* (diabetes) etc, both T. terrestris L. and P.murex L. appear to be appropriate.

4.4 Using different parts of the plant: The root of Sida cordifolia Linn. and the whole plant of Sida cordifolia Linn. can be considered. Root has the chemical constituents such as sitoindoside, acylsteryglycoside, while the whole plant has alkaloid, hydrocarbons, fatty acids and ephedrine. Various extracts of the whole plant showed antibacterial, antioxidant, hypoglycemic, hepatoprotective and cardio tonic activities. Though it is the root which is mentioned as officinal part of S. cordifolia Linn. in the classics as *Balya* (promotes strength), *Shotahara* (reduce inflammation) etc. Modern researches prove that even the aerial parts are also equally effective.

4.5 Due to same in action: Embelica officinalis Gaertn. shows antioxident, hepatoprotective, antimicrobial, hypoglycemic and hypolipidemic action. Semecarpus anacardium Linn. shows anti-tumour, hypotensive, anticytotoxic and anticancerous properties etc. Both *Amalaki* and *Bhallataka* are *Rasayana* (rejuvenator) drugs. In current practice the *Rasayana* formulations are being employed as an adjuvant therapy in Chronic as well as Malignant diseases. *Amalaki* can be employed as *Rasayana* in Chronic debilitating diseases like bronchial asthma, diabetes etc, while *Bhallataka* would be better choice in malignant conditions, both in solid tumours and in leukaemia.

Reasons for substitution[5]

1) Non-availability of the drug: Sometimes there may be non-availability of drugs. E.g: *Astavarga dravyas* (group of 8 crude drugs).
2) Cost of the drug: It is very essential component for economy of the drug.eg. As *Kumkum* being costly drug can be substituted by *Kusumbha*.
3) Adverse reaction of the drug: Due to the adverse reaction of the drug on patient there is necessity of substitution. *Vasa* having abortificiant activity its use is limited for pregnant women besides that *Laksha, Ashoka* can be substituted.
4) Shelf life of the drug: Shelf life of the drug is also another reason for substitution e.g. no availability of old jagerry, new jagerry after heating in sun rays for four hours can be used.
5) Uncertain identity of the drug: Herb *Lakshmana* and different species such as Aralia quinquefolia L. and Ipomea sepiaria Koienig ex Roxb. etc. are considered.
6) Seasonal availability of drugs: Due to limited availability of the drug round the year, other available drugs, having similar actions are used. E.g. Trianthema portulacastrum Linn. can be used in seasonal absence of Boerhavia diffusa Linn.

Concept of bheshaj pariksha vidhi[6]

तस्यापीयं परीक्षा- इदमेवंप्रकृत्येवंगुणमेवंप्रभावमस्मिन देशे जातमस्मिन्नृतावेवं गृहीतमेवं निहितमेवमुपस्कृतमनया च मात्रया युक्तमस्मिन् व्याधावेवंविधस्य पुरुषस्येवतावन्तं दोषमपकर्षत्युपशमयति वा, यदन्यदपि च एवं विधं भेषजं भवेतच्चानेन विशेषेण युक्तमिति ॥

(च. वि. 8/87)

The standardization techniques were described in *Vimansthana* of *Charaka-Samhita,* by *acharya charaka*

1) ***Edam evam prakritim:*** *Dravya Prakriti*
2) ***Evam gunam*****:** Physical-*Rasa, Veerya, Gurvadi Gunas* and chemical Properties.
3) ***Evam prabhavm*****:** Therapeutic actions.
4) ***Asmin deshe jatam*****:** Botanical distribution
5) ***Ritu eva grihitam*****:** Time and method of collection.
6) ***Nihitam*****:** Method of preservation.
7) ***Upaskritam*****:** *Sanskar*, Pharmaceutical processing for its preparations.
8) ***Matra*****:** Dosage
9) ***Vyadhi*****:** Various diseases in which drug can be therapeutically used.
10) ***Evam vidham purushasya*****:** Clinical trials

1) *Edam evam prakritim*: (*Dravya prakriti*)

- It includes name, nature and morphology of *Dravya*. The biological nomenclature description of *Dravya* is described by *Narahari Pandit* in *Raj- Nighantu* as follows.[7]

1. *Rudhi* (Traditional use): *Aatarusaka, Tuntuka*
2. *Prabhava* (Effect): *Krimighna, Hayamara*
3. *Desyokti* (Habitat): *Magadhi, Kalinga*
4. *Lanchana* (Morphological character): *Rajiphala, Chitraparni*
5. *Upama* (Simile): *Salaparni, Ajakarna*
6. *Virya* (Potency): *Usana, Sita*
7. *Itarahvaya* (Due to other factors): *Sakravaha, Kakahva*

2) *Evam gunam*

The *Guna* of a *Dravya* is based on *Pancha-bhautikatwa* and on *Rasadi* properties.

A. On the basis of *Pancha-bhautikatwa*

Panchabhautik constitution of *Dravya* can be determined on the basis of predominant *Rasa* present in them as specific *Rasas* are having dominance of specific *Mahabhutas*.

Rasa	**Predominant *Mahabhuta* (Acco. to *Acharya Charak*)[8]**
Madhur	*Prithvi + Jala*
Amla	*Prithvi + Agni*
Lavan	*Jala+ Agni*
Katu	*Vayu + Agni*
Tikta	*Vayu + Akash*
Kashay	*Vayu + Pruthvi*

B. On the bases of *rasadi* properties

The term *Rasadi* properties refers to *Rasa, Guna, Veerya, Vipaka* and *Prabhava*. Which are as follows.

(i) Determination of *rasa*[9]

Rasa of a drug is gustatory appeal. It is told by *Acharya Charaka* that

"रसो निपाते द्रव्यानाम"

(च. सू.-26/66)

I.e. *Rasa* is perceived through the contact of *Dravya* with gustatory sense organ and is called gustatory perception. This is the best way to know about the *Rasa* of a *Dravya.*

- General sense of taste: By direct perception (*Pratyaksha*)
- Specific sense of taste: By inference (*Anumana*)
- Experimental knowledge of taste: By authoritative statement

(ii) Determination of *gunas*[10]

The term *Guna* literally means the properties or qualities of any substance or *Dravya*. But in *Ayurveda* it means physicochemical or pharmacological properties of the *Dravyas*. *Shareerika Gunas* and *Paradi Gunas* are considered very important in the concept of *Bheshaj*.

(iii)Determination of *veerya*[11]

Veerya is known as potency of the *Dravya* which is known by *Pratyaksha*, *Anumana* as well as by both. The *Virya* of some *Dravya* is known from *Nipata* (*Pratyaksha* e.g. – *Maricha*) which comes in direct contact with tongue or skin, some *Dravya* from *Adhivasa* (*Anumana*) e.g.- *Anupa mamsa* and some by both *Adhivasa* and *Nipata* e.g.-*Maricha*.

Kriya	Pramana	Examples
Nipata (contact with body)	*Pratyaksha* (perception)	*Maricha (Tikshna)*
Adhivasa (stay in body)	*Anuman* (inference)	*Anupa mamsa*
Nipata- Adhivasa	*Pratyaksha- Anumana*	*Maricha (Ushna)*

Classification of *ashtavidha veeryas*

- *Sheeta Ushna*
- *Guru Laghu*
- *Snigdha Ruksha*
- *Mrudu Teekshna*

(iv)Determination of *vipaka*[12]

End product of a *Dravya* which is the outcome of digestion/ metabolism is known as *Vipaka*. In Ayurveda, *Vipaka* is associated with the *Rasa* i.e. a fixed *Vipaka* is associated with corresponding *Rasa*.

कटुतिक्तकषायाणां विपाकः प्रायशः कटु। अम्लोऽम्लं पच्यते स्वादुर्मधुरं लवणस्तथा ।।

(च.सु.-26/58)

Thus, it can be assessed by the knowledge of *Rasa*. *Vipaka* of a drug is inferred by its properties after it has undergone digestive and metabolic transformations. Thus, *Vipaka* can also be assessed by its action produced on *Doshas*, *Dhatus* and *Malas*. It can also be assessed on the bases of the available literary information, regarding its properties and actions. It would be based upon the *Trividha Vipaka Vada* of Ayurveda.

(v) Determination of *prabhava*

Prabhav is a unique action of a drug. It can be defined as an action of a *Dravya* which we cannot attribute to any of its *Rasapanchaka*. Such examples are very few and no test parameters are available for its assessment. It is applicable only in case of few drugs.

3) *Evam prabhavm*

Prabhava here stands for Specific Action of a Drug. It is the property of drug which is responsible for peculiar action.

रसवीर्यविपाकानां सामान्यं यत्र लक्ष्यते। विशेषः कर्मणां चैव प्रभावस्तस्य स स्मृतः।। (च.सू.-26/67)

Prabhava is also quoted as *Achintya virya*. According to *Charaka* drug action is possible by means of three aspects[13]

a. Dravya prabhava

b. Guna prabhava

c. Dravya guna prabhava

- In modern *Prabhava* can be correlated with ‘Pharmacodynamics’ i.e. effects of a drug on body systems are studied.

4) Asmin deshe jatam

Here *Desha* is considered, the area where *Dravya* or the herb is grown which can be called habitat. The habitat is made up of Panchamahaboota and varies from place to place. Some of

the plants are grown only in specific area. Some of the *Dravyas* may be found everywhere but still the properties and their active principles differ as per the area and the ecological conditions. As per classical texts *Dravya* should be collected from *Prashasta Desh.*

- As a general opinion *Acharya Sharangdhar* says that all *Ushna Virya Dravya* are to be collected from Vindhya hills and *Shita Virya* are to be collected from Himalayan ranges.[14]

- The land may be categorized on the basis of *Pancha mahabhuta* predominance and drugs for different purposes are to be collected from soil of different *Mahabhuta* dominance as mentioned by *Maharshi Sushruta*.[15]

Dravya	**Collecting place (predominant Mahabhuta)**
Virechan Dravya	*Prithvi* and *Jala Mahabhuta*
Vamana dravya	*Agni, Akasha, Vayu*
Ubhayaja dravya	*Soil* of all *Mahabhuta* predominant
Samana dravya	*Akasha Mahabhuta*

- Plant grown near temples, *Valmika* (anthill soil), *Kutsita* (*Bibhatsa sthana*), *Anupa* (marshy land), *Smashana* (burial grounds), *Usara pradesha* (saline soil), *Marga* (walking lanes), *Jantu Pidita*, *Agni Dagdha* and *Himavyapata* are unfit for therapeutic use.[16]

5) *Ritu grihitam*

In Ayurveda, *Prashasta Ritu* and *Kala* for drug collection i.e., season, time of collection and storage method are well described (C.K.1/10). for the effective results**.** Modern science also states that a standard quality drug can be obtained only if it is collected by Good Collection Practise

Plant part	**Classical view**[17]
Moola (root and rhizome)	*Grishma* and *Shishir* (summer and late winter)
Kanda (bulb)	*Sharad* (autumn)
Twak (bark)	*Sharad* (autumn)
Shakha- Patra (leaves and stems)	*Vasanta* and *Varsha* (spring & rainy season)
Pushpa (flowers)	A/c to flowering season
Phala (fruits)	A/c season of maturity of food
Bija (seed)	———
Saar (heartwood)	*Hemanta* (early winter)
Niryas (latex)	*Sharad* (autumn)

6) *Nihitam*

Preservation methods for drugs are very essential for future use in treatment. The medicinal drug should not come in contact with insects, instruments, smoke, sunshine, air, fire, water and bacteria. The containers like vessels, jars, drums, etc, should be in a way that these should not affect the properties of drugs. The drugs which are to be used in fresh form should not be preserved. Some of the drugs like honey, Piper longum L., Embelia ribes Burm.f. are used after preserving them for 1 year. The main aim of preservation of drugs is to maintain its potency by conserving its properties and actions. A preservation technique varies from sample to sample.

7) *Upaskrit*

Pancha vida kashaya kalpana has told in *Bheshaja Kalpana*, like *Swarasa*, *Kasaya*, *Kwatha*, *Hima*, *Fanta*. Further the derivatives of these *Kashasy Kalpana* are also mentioned, which may be for single drug or for compound formulation. The formulations are prepared to make the drug more potent, to preserve for longer time, palatable and to get effective results.

8) *Matra*

Sharangadara stated there is no specific dosage for everyone. To decide the dose individually *Kala-Agni-Vayah-Bala-Prakriti-Dosha-Desha* are to be considered. Then only the dose is finalized.[18]

Deciding the dosage of a drug plays an important role in the treatment. Dosage must be decided on the basis of *Vyadhi Bala, Agni Bala* and *Rogi Bala*.

9) *Vyadhi*

The physician with all the knowledge of the *Dravya shastra* and *Vyadhi* with his *Yukti* he has to choose/select proper *Dravya* to the particular disease. Single *Dravya* can be used in various diseases depending upon its signs and symptoms.

10) *Evam vidham purushasya*

After going through the details of the above-mentioned concepts, it is safe to administer on the person i.e. clinical trial.

In ancient period *Aacharyas* used to prepare the formulations by themselves as per the requirement instantly, starting from identification process till its preparation, Due to rich heritage of natural resources. But in current era it is difficult. As well as adulteration and

substitution is also increased. So before going to clinical trial animal experiment has to be conducted by following the standardization techniques.

Analytical evaluation techniques in herbal drug[19]

The modern guide lines of standardization of drugs, to prove the identity and purity, the criteria such as the macroscopic evaluation, organoleptic evaluation, microscopic evaluation, chemical evaluation, physical evaluation, biological evaluation, chromatographic techniques, adulteration, contaminants, moisture, ash content and solvent residues have to be checked. The correct and proper identity of the herbal drug is of prime importance in establishing the quality control of herbal drugs.

Macroscopic and organoleptic evaluation

The organoleptic evaluation of a drug by means of sense organs or macroscopic evaluation is the evaluation of the drug by its colour, odour, taste, shape, size and touch, which is based on the study of morphological and sensory profile of the drug.

Microscopic evaluation

This examination of drug is used to identify the organized drugs by their histological features with the help of microscope. For detecting various cellular tissues, trichomes, stomata, starch cells, calcium oxalate crystals, etc.

Chemical evaluation

The qualitative chemical tests are used to identify certain drugs to test their purity, isolation, active constituents, purification and for detection of adulterants.

Physical evaluation

These include moisture content, specific gravity, refractive melting point, viscosity and solubility in different solvents. These criteria are useful in identification of constituent drugs present in the plants.

Biological evaluation

Some drugs have specific biological and pharmacological activity which is utilized for their evaluation especially in plant extract. Here the experiments are carried out on both intact and isolated organs of living animals. With the help of bioassays, strength of drug can be evaluated.[19-21]

Chromatographic techniques

Chromatography may be preparative or analytical. The purpose of preparative chromatography is to separate the component of a mixture for later use, and is thus a form of purification. Analytical chromatography is done normally with smaller amount of material and is for establishing the presence or measuring the relative proportions of analytes in a mixture. The techniques like

Column chromatography

Planar chromatography

Gas chromatography

Liquid chromatography

Supercritical fluid chromatography

Ion exchange chromatography

Size-exclusion chromatography

Expanded bed adsorption chromatography and many more are used.

Along with the above mentioned standardization techniques, Knowledge of *Vriksyaurveda* is also an essential science to over the difficulties. *Vṛkṣāyurveda-Surapāla's* text deals with arbori-horticulture and gives considerable information on the importance of trees, soil types, selection of suitable land, soil characteristics, classification of plants, seed, sowing, planting, plant protection recipes, nourishment, types of gardens, locating groundwater, and bio-indicators to decide the suitability of raising specific crops, examination and treatment of seeds, digging of planting pits, different methods of irrigation, plant nutrition, fertilizers, diseases of trees and their treatment, the wonders of horticulture, plant conservation etc.

For treating disorders, *Surapāla* suggests using a number of plant species that we know today have antimicrobial properties, including mustard paste and milk. *Svātī, Hasta, Rohiṇī, Śravaṇa* and *Mūla* are considered to be good stars for planting trees. The distance between trees should be minimum twenty rods. If the tree does not bear fruit, the stem should be examined by cutting with a knife. Then mix powdered vermifuge seeds with ghee and smear it on the cut. Then water the tree. Watering the trees with fish-water will make them yield fruits more quickly. Mixture of Vermifuge seed, fish and rice is a good manure. This manure is a good remedy for all diseases of trees.[21] (*Agni Purāṇa Chapter 281*).

CONCLUSION

This study can be concluded that both *Dravya Pariksha Vidhi* as per *Ayurvedic* perspective and modern Pharmacognostic are important for evaluation and standardization of a drug or any formulation. But in this era, it is high time to have a control over both intentional & unintentional adulteration. Substitutes may be used as per the requirement but not the *Pradhan Dravya*. To protect critically endangered, rare and costly medicinal plant species there is a great demand of using cell culture techniques development, propagation, conservation, cultivation, motivate farming and growing of endangered, rare species for large scale farming. For getting good yield of the required needs from the plants the knowledge of *Vrikshayurved* is also very important this is the branch of science deals with knowledge of plant life, in all aspects. Genetic engineering in agriculture becomes more efficient and resilient. By considering all the above factors, we can meet today's needful demand by preserving our cultural health care heritage and traditional, *Shastra oushadhee* therapy drug development to provide traditional original medicinal plant-based standard quality products to our nation.

REFERENCES

1. Om Prakash Verma, Adulteration and Substitution in Indian Medicinal Plants: An Overview, Journal of Medicinal Plants Studies, July, 2013; 1(4): 127-132.
2. Shahane Snehal, Tekade Anand, Dive Mukund, Daulatkar Kavita, Adulteration and Need of Substitution of Raw Materials – A Review, International Journal of Ayurveda and Pharma Research, July, 2018; 6(7): 92-95.
3. Puneshwar Keshari, Controversy, Adulteration and Substitution-Burning Problems In Ayurveda Practices, International Ayurvedic Medical Journal, 2017; 5(7): 2505-2516.
4. Om Prakash Verma, Adulteration and Substitution in Indian Medicinal Plants: An Overview, Journal of Medicinal Plants Studies, July, 2013; 1(4): 127-132.
5. Shahane Snehal, Tekade Anand, Dive Mukund, Daulatkar Kavita, Adulteration and Need of Substitution of Raw Materials – A Review, International Journal of Ayurveda and Pharma Research, July, 2018; 6(7): 92-95.
6. Agnivesha, Edited by Vaidya Yadavaji Trikamaji Aacharya, Charak Samhita, Chaukhambha Prakashan, Varanasi, Reprint, 2013; 275.
7. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 21: 1.

8. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 199.
9. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 207.
10. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 150.
11. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 275.
12. (JLN Shastry), Dravyaguna Vijnana Chaukhambha Orientalia; Edition: Reprint, 2009; 1: 130.
13. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 279.
14. Dr. Brahmahanand Tripati Sharangadara Samhita. Prathama Khanda chaukhambha surabharati prakashan page No, 15: 1, 61-63.
15. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 386.
16. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 382.
17. Aacharya Priyavrat Sharma, Dravyagun Vigyan Chaukhambha Bharati Academy, Varanasi, Revised golden jubilee edition, 2008; 1: 384.
18. Dr. Brahmahanand Tripati Sharangadara Samhita. Prathama Khanda chaukhambha surabharati prakashan page No, 7 - 8 1, 37-38.
19. Ahirwal B, Ahirwal D and Ram A. Evaluation of standards and quality control parameters of herbal drugs, souvenir, recent trends in herbal therapy, 2006; 9: 25-2.
20. Williamson E, Okpako DT, Evans F J. Pharmacological Methods in Phytotherapy Research, Preparation and Pharmacological Evaluation of Plant Material. John Wiley and Sons, Chichester, 1996; 1(1).
21. Li N, Lin G, Kwan YW, Min ZD. Simultaneous quantification of five major biologically active ingredients of saffron by high-performance liquid chromatography, J. Chromatogr. A, 1999; 849(2): 349-355.