



CRITICAL ANALYSIS OF PLANT NOMENCLATURE IN AYURVEDA AND ITS INFLUENCE ON BINOMIAL NOMENCLATURE

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ABSTRACT:

Ayurveda is the oldest holistic science. The primary tool in treatment of Ayurveda are herbs which are collected from indigenous flora. The importance and apt use of plants in treatment begins from Vedic period. Furthermore, Acharya Charaka quotes that no plants on the universe is devoid of medicinal value. It is upon the intelligence of Vaidya to utilize these medicinal plants effectively. The medicinal plants were named accordingly and few were modified in later literatures. It was made sure that the plant names and synonyms in Sanskrit defined either their morphology or actions or both for ease in identification and usage such as karanja has synonym Snigdha patra owing to its glabrous leaf surface and its Botanical name is Pogamia glabra where glabra means glabrous or smooth. Another example, Yastimadhu and its synonym Madhuka both denotes sweetness and its Botanical name Glycyrrhiza glabra where Glycyrrhiza refers to sweet taste. The present naming system of plants, binomial nomenclature somewhat seems to have references from Ayurveda's naming system. This article tries to highlight few examples to put thought over the ideology of naming of plants in Ayurveda.

Keywords: Binomial Nomenclature, Basonyms, Synonyms, Botany, Taxonomy, Atharvaveda, Naming systems

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INTRODUCTION

Medicinal plants are of most importance in Ayurveda and are key to efficient therapeutics. The deep knowledge of medicinal plants on its morphology and action potency enhances not only the identification but also the therapeutics. The references of existence and rational use of medicinal plants in a systematic way goes back to Vedic period where natural vegetation was utilized in day-to-day life. Vedic literatures such as the *Shaunak sutras*, *Rig Veda*, *Atharva Veda* etc, have given elaborate information on classification of the plant kingdom ^[1].

Atharva veda has mentioned more than 200 herbs like *Atasi*, *Aparjita*, *Arka*, *Arjuna*, *Guggulu*, *Palasha*, *Apamarga*, *Prisniparni*, *Ashwatha*, *Nyagrodha*, *Arjuna* etc ^{[2][3]}. Utmost care was taken while naming a plant in *Ayurveda* to bring maximum possible meaning out of the word. *Sanskrit* names of the plants, from Vedas, tried to bring out information about the plant, from simple morphology to therapeutic application of that plant. Some *Sanskrit* names from Vedic period are still in use such as *Udumbara*, *Ashwatha* etc whereas few have been slightly modified like *Gulgul* to *Guggulu* now. Later, in *Samhita* period many *dravyas* and their uses were mentioned elaborately and *Nighantu* period added new drugs along with new synonyms, precise

description of *dravyas* with their morphological characters for easy identification & proper therapeutic utilization ^[4].

It is also said that the plants should be identified with help of cowherd, hermits, hunters, fowlers and those who wander around in forest and one who live by eating plant roots and tubers ^[5].

Ayurveda names a medicinal plant on different basis like *Rudhi*, *Prabhava*, *Desha*, *Jati*, *Aakruti*, *Varna* etc. Mainly, basonyms and synonyms were coined to identify a medicinal plant which described the salient features of plants like its morphological characters, action, form, look-a-like *dravyas*.

Whereas modern science has Binomial nomenclature system of naming. It can be defined as a system of nomenclature in which each species of plant receives a name of two terms of which the first identifies the genus to which it belongs and the second the species itself ^[6]. These botanical names of plants are majorly in Latin language, few include the botanist/scientist's name.

Naming of medicinal plants in Ayurveda

Namakarana of an *aushadhidravya* then, was equally scientific as current nomenclature system which sometimes seems to be taken from *Ayurveda* and further scientifically proven. Earlier, drugs having morphological

similarities were named with similar word or one word used as other's reference for identification such as *taambula*, *dravya* with similar morphology were named by referring to *taambula* like *Vruddhadaaru* (*Patreh.....taambulatulayah*), *Varahikanda* (*taambulavallichada....*), *Pippali* (*.....Nagavallidala*). The easily recognisable *dravya*'s names were used as reference to unpopular *dravyas* [7].

Rajanighantukara in *Raja Nighantu* [8] has assigned *nama* and *pariyayas* based on seven bases, like,

- a) *Rudhi* – names which have no specific derivation or meaning but have been in use since ages

Ex: *Tuntuka*, *Katvanga* = *Shonyaka*;

Guduchi = *Amruta*;

Atarushaka = *Vasa*;

- b) *Prabhava* - names based on special effects of plant

ex: *Krimigna* (having capacity to kill krimi) = *Vidanga*;

Kustagna (has special action in treating skin diseases) = *Khadira*;

- c) *Desyokti* – regional names

Ex: *Magadhi* = *Pippali*; the plant growing in Magadhi area

Malayaja = *Chandana*; the plant growing around Malaya region

- d) *Lan cahana* – based on morphology or symbol

Ex: *Chitraparni* = *Prisniparni*; the leaves of this plant are picted.

Chitrabeeja = *Eranda*; the seeds of *Eranda* have design on it.

- e) *Upama* – based on similies

Ex: *Shamipatra* = *Lajjalu*; the leaves of this plant collapse on touch.

Udumbaraparni = *Danti*; the leaves of *Danti* resembles *Udumbara*.

- f) *Virya* – named on potency of the plant

Ex: *Ushna* = *Shunti*, *Chitraka*; plants having hot potency.

Ushnaa = *Chavya*, *Pippali*; hot potency drugs.

- g) *Itarahvaya* – named on other factors

Ex: *Shakrahvaya* = *Kutaja*;

Kakahvaya = *Kakamachi*;

Dhanvantari Nighantu [9] has given names based on,

- i. *Jati* – nature or type of a plant

Ex: *Amrutavalli* = *Guduchi* } (these are *valli* in nature)

Gopavalli = *Sariva*;

Viravruksha = *Arjuna* (it is *vrusha* ie tree)

- ii. *Aakruti* – shape or morphology

Ex: *Koshtuka puchhika* = *Prishni parni*; the inflorescence resembles fox's tail.

- iii. *Varna* – colour of the plant

Ex: *Dhavala Vitapa* = *Arjuna* has whitish bark.

iv. *Veerya* – potency of the drug

Ex: *Ushana* = *Maricha*; refers to hot potency of the plant.

Shitashivaa = *Karpoora*; refers to cold potency of the plant.

v. *Rasa* – taste of the drug

Ex: *Amlika* = *Chincha*; denotes sour taste of the plant.

Katu Kanda= *Rasona* has *katu rasa*.

vi. *Prabhava* – special actions of the drug

Ex: *Unmatta* = *Dhatura*; used to treat mental disorders.

Grahanashan= *Saptaparna* used to treat *grahana* conditions.

vii. *Guna* = properties of the drug

Ex: *Picchila* = *Shalmali*; refers to sliminess property of the drugs

Tikshna = *Vacha* has sharpness as quality.

Binomial nomenclature of medicinal plants

Today, many medicinal plants are being used for therapeutic purpose which somehow are under identity crisis due various reasons like regional bias, slight morphological changes, seasonal variations, confusion in common names etc. Thus, identifying each and every medicinal plant with its own unique name is very essential. As a solution, in 1596, Gaspard

and Johann Bauhin brothers, Swedish botanist developed a naming system to describe plants using a genus/species. Later, in 1735, Carl Linnaeus, famously known as “Father of Taxonomy”, adopted Bauhin brothers naming system & created Binomial nomenclature to avoid errors, duplication, confusion & ambiguity in identifying plants ^[10].

Correlating plants nomenclatures

Latin was primary language used in Binomial nomenclature because it is considered as a dead language where no new words or slang are created or changed through years ^[11] whereas Sanskrit being ancient and classical language of India, is source of all other languages. Therefore, as Latin is to Western medicine so is *Sanskrit* to *Ayurveda*.

The birth of Latin took place around 7th century BC ^[12] which was much later than the *Sanskrit*, 2nd century BC ^[13] and also the modern styled naming system began in 17th century AD ^[14] which evokes question if the Latin terms in scientific names have references from *Ayurveda*, by the Sanskrit names & synonyms of the plants. For instance, following table correlates the names in *Sanskrit*, Latin along with their meaning.

Table no.1 showing correlation names of medicinal plants in Sanskrit and Latin

Sl no .	Sanskrit name	Synonyms	Amarakosha meaning	Botanical name	Meaning
1.	<i>Apamarga</i> ^[15]	<i>Kharamanjiri</i>	<i>Kantakitvaat kharasparshaa pushpamanjari</i> Inflorescence has spinous bracteoles & pointed perianth, thus its prickly.	Achyranthes	Thorn
		<i>Adahshalya</i>	<i>Kantakipushpaanaamadhomukh atvat</i> Refers to downward facing spinous bracteoles & pointed perianth.	Aspera	Spin bract inflorescence
2.	<i>Aragvadha</i> ^[6]	-----	-----	Cassia	Hollow / empty
		<i>Dheerghaphala</i>	<i>Dheerghamphalam yastivadsya</i> Indicates long fruits.	Fistula	Tube
3.	<i>Bhallataka</i> ^[17]	<i>Tailabeeja</i>	<i>Tailam beejeesya</i> Pertaining oil contents in seed	Semecarpus	Marking nut
		<i>Dhanurbeeja</i>	<i>Dhanurivabeejamasya</i> Refers to obliquely ovoid shaped seed	anacardium	Heart like
4.	<i>Shweta chandana</i> ^[18]	<i>Gandhasaarah</i>	<i>Gandhah saareasya</i> Refers to Aroma of <i>Chandana</i>	Santalum	Aroma
		-----	-----	album	White
5.	<i>Dadima</i> ^[19]	<i>Vrutaphala</i>	<i>Vrutam phalamasya</i> Round fruits	Punica	Apple
		<i>Beejapuraka</i> ^[20]	<i>Phalam beejam cha purayati</i> ^[21]	Grantum	Filled with seeds

			Means the seeds are filled in fruits of <i>Dadima</i>		
6.	<i>Dhataki</i> ^[22]	-----	-----	Woodfordia	Scientist name
		<i>Gucchapushpa</i>	<i>Gucche pushpanyasyah</i> <i>Bunches of flowers</i>	Floribunda	Cluster of flowers
		<i>Bahupushpika</i>	<i>Bahuni pushpanyasyaah</i> It has many flowers		
7.	<i>Gokshura</i> ^[23]	<i>Trikantaka</i>	<i>Trayah kantakah phalesya</i> Fruit has three spines	Tribulus	Three sides
		-----	-----	Terrestris	Ground
8.	<i>Gambhari</i> ^[24]	-----	-----	Gmelina	Scientist
		<i>Kashmarya</i>	<i>Kashyate prakshyate iti</i> Refers to beautiful tree	Arborea	Tree
9.	<i>Atasi</i>	<i>Tailaphala</i>	<i>Phalam tailavat</i> / Fruits contain oil	Linum	Oil
		-----	-----	usitatissimum	Commonly used
10.	<i>Arishtaka</i>	<i>Phenila</i>	<i>Phenoasyaasti</i> ^[25] Produces <i>phena</i> ie foam	Sapindus	Soap
		-----	-----	emerginatus	Emerged apex
11.	<i>Asthisrunkal</i> ^a ^[26]	<i>Vajravallari</i>	<i>Vajram asthi, tasya lateva</i> Weak plant	Cissus	Climbing habit
		<i>Chatushira</i>	<i>Chatusrah shirah</i> Plant has quadrangular stem	quadrangul aris	Four angled
12.	<i>Amalaka</i>	<i>Amlika</i> <i>Amalaka</i>	-----	Emblica	Sanskrit origin
		-----	-----	Officinalis	Recognised in pharmacopoeia

13.	Upodika	-----	-----	Basella	-----
		Raktadanda	Red coloured stem	Rubra	Red colour
		Raktabeeja	Red coloured seeds		
14.	Ushira ^[27]	-----	-----	Vetiver	Tamil origin
		Jalavaasa	Jale vasati iti Grows near water resources	Zizanoides	River side
		Jalaashayam	Jalam aashete tishtati atra, iti va ^[28] Found in and around water		
15.	Kappikacchu ^[29]	-----	-----	Mucuna	Brazilian name
		Kacchuraa	Causes kandu ^[30]	Pruriens	Itching
		Kandukari			
		Kandura	Kandumrati dadati That which produces intense itching		
16.	Karanja ^[31]	-----	-----	Pongamia	Scientist
		Snigdhapatra	Snigdhani patranyasya Glossy leaves	Glabra	Smooth
		Snigdhakaranja	Indicates snigdhata of karanja		
		Ghrutaparna	Ghrutavat snigdhani parnanyasya Shiny leaf of Karanja		
17.	Kakodumbhara ^[32]	-----	-----	Ficus	-----
		Karkashacchadana	Refers to roughness of leaf	hispida	Thickly covered with long stiff bristly hair
		Kharapatra	Kharaanikarkashanipatranyasya Scabrous leaves		
		Kharapatrika			
18.	Kusumbha	-----	-----	Carthamus	-----
		Ranjanadravya	Coloring agent	Tinctorius	Pertaining to dye
		Vastraranjaka	Vastram ranjayatiti ^[33]		

		<i>Vastraranjini</i>	Dyeing agent		
19.	<i>Ketaki</i>	-----	-----	Pandanus	Malayalam origin
		<i>Gandhapushpa</i>	Pertaining to fragrance	odoratissimus	Very fragrant
		<i>Stiragandha</i>			
		<i>Sugandha</i>	<i>Shobhano gandhoasya</i> / ^[34] Fragrant flowers		
20.	<i>Khadira</i> ^[35]	-----	-----	Acacia	Pointed
		<i>Saaradhruma</i>	<i>Saaravaan vrukshah</i> / It contains medicinally used <i>saara</i> (heartwood)	catechu	Extract from heartwood
		<i>Raktasaara</i>	<i>Raktavarnah saaroyasya</i> / Red coloured heartwood		
		<i>Susaara</i>	Indicates heartwood of <i>Khadira</i>		
		<i>Bahusaara</i>			
		<i>Mahasaara</i>			
21.	<i>Chakramard a</i>	-----	-----	Cassia	-----
		<i>shatpantipatra</i>	Means six leaves	Tora	Six
22.	<i>Changeri</i> ^[36]	<i>Kshudra amlika</i>	<i>Hrusvaamlिकासadrushi</i> / Sour in taste	Oxalis	Sour
		<i>Aamlonika</i>	<i>Amla cha lonikavat dala cha</i> / Sour leaves resemble as <i>lonika</i>		
		<i>Amlaparni</i>	Sourness of leaf		
		<i>Amlapatrika</i>	<i>Amlaani patranasya</i> / The leaf tastes sour		
		<i>Amlika</i>	Pertaining to sourness		
		-----	-----	Corniculate	Small horns
23.	<i>Danti</i> ^[37]	<i>Chitra</i>	<i>Chitritaani beejaanyasya</i> / Seeds are spotted	Baliospermum	Spotted seeds
		<i>Upachitra</i>	<i>Upagatani</i> <i>chitrani</i>		

			<i>beejaanyasya</i> / Seeds are coloured in patches		
		-----	-----	Montanum	Grows on mountain
24.	<i>Patala</i>	-----	-----	Stereospermum	A solid seed
		<i>Sugandhipushpavruksha</i>	Tree bearing sweet smelled flowers	Suaveolens	Sweet smell
		<i>Stiragandha</i>	<i>Sthiro gandhoasya</i> / ^[38] Fragrant with stable aroma		
25.	<i>Paribhadra</i> [39]	<i>Raktakusuma</i>	Indicates red colour of flowers	Erythrina	Red colour flowers
		<i>Raktapushpa</i>			
		<i>raktakesara</i>			
		-----	-----	Indica	Of India
26.	<i>Prishniparni</i> [40]	<i>Simhapuccha</i>	<i>Simhasya pucchamiva</i> <i>oushpamanjaryasya</i> / Inflorescence resembles tail of Tiger	Uraria	A tail
		<i>Swapuccha</i>	Inflorescence looks like dog's tail		
		<i>Srungalavinna</i>	<i>Srungealasya pucchamiva</i> <i>pushpamanjaryasya</i> / Inflorescence resembles jackal's tail		
		<i>Krostukapucchika</i>			
		<i>Upachitra</i>	Picted leaf	Picta	Painted brightly coloured
		<i>Chitraparni</i>	<i>Chitritam parnamsya</i> / Coloured leaf		
27.	<i>Shaka</i> [41]	-----	-----	Tectona	Tamil origin
		<i>Mahataru</i>	Large tree	Grandis	Large
		<i>Mahashaka</i>	Huge tree		
		<i>Mahapatra</i>	Huge leaf		
		<i>Dheerghachada</i>	Long big leaf		

28.	<i>Yastimadhu</i> [42]	<i>Madhuka</i>	<i>Madhu iva madhuka /</i> Tastes sweet as Honey	Glycyrrhiza	Sweet root
		-----	-----	Glabra	Smooth hairless
29.	<i>Daruharidra</i> [43]	-----	-----	Berberis	Arabic name
		<i>Kantakini</i>	<i>Patre kantakayukta /</i> Has spines on leaves	Aristate	Elongated projecting bristle
		<i>Katamkateri</i>	<i>Patraanaam kantakitvaat /</i> Leaves contains spines		
30.	<i>Hingu</i> [44]	-----	-----	Ferula	-----
		<i>Ugragandhi</i>	<i>Ugragandha yasya sa /</i> <i>Hingu has strong odour</i>	foetida	Foul smell
31.	<i>Madanapha la</i> [45]	-----	-----	Randia	Botanist
		<i>Karahaatah</i>	<i>Karam haatayati vyathayathi,</i> <i>kantakitvaat /</i> It contains thorns which may harm when unnoticed	Dumetorum	Thorny bushes
		<i>Shalyaka</i>	<i>Kantakitvaaccha /</i> it has thorns		
32.	<i>Manjista</i> [46]	<i>Raktangi</i>	<i>Raktamangam kaandam mula cha asya /</i> Refers to red color of stem & roots of the plant	Rubia	Red
		<i>Aruna</i>	<i>Raktabhakaanda /</i> Reddish coloured stem		
		<i>Raktayastika</i>	<i>Raktam kaandamsyaa /</i> <i>Manjista stem is red colour</i>		
		-----	-----	Cordifolia	Heart shaped leaf

DISCUSSION

Every medicinal plant needs its identification through its specific name to avoid ambiguity. As *Acharya Charaka* says a *dravya* when known perfectly acts like *amruta* hence, proper identification and usage its highly essential. And for proper identification several relatable synonyms were given to a Medicinal plant based on morphology, forms, action. The names in *Ayurveda* to a medicinal plant are so accurate that each synonym depict its exact character for example *Chitrabeeja* for *Eranda* which depicts the unique design on its seed. Similarly, Binomial nomenclature aimed to avoid the confusion created with local names as the vernacular names are different for same medicinal plant and may be same local name for different medicinal plants. Hence, a scientific name eases the identification without any confusion.

From above table no. 1, analysing the basonyms, synonyms and botanical names along with the meaning it seems that the current plant nomenclature system is influenced by the *Ayurveda's* naming system. To add up, certain Botanical names of Medicinal Plants have direct reference as that like adopted from *Sanskrit* names such as *Saraca asoca*, *Nardostachys jatamansi*, *Michelia champaca*, *Shalmalia malabarica* & few examples as *Adhathoda vasica*, suggest slight modification of *Sanskrit* words.

CONCLUSION

The references from Vedic period till *Nighantu* period and current add ups to the list of medicinal plants gave enough proof to claim that plants were identified with medicinal properties and effectively used in treatment & rejuvenating therapies. Medicinal plants being the primary tool in *Ayurvedic* treatments were named after their morphology & action precisely. Further, naming system was improved by adding synonyms to basonyms by later *Nighantukars* like *Raja Nighantu* who named on 7 bases. Carl Linnaeus, botanist, came up with binomial nomenclature system of naming plants in Latin language to avoid any confusion in identification. Today, correlating the names of plants in Sanskrit and Latin, reflects that Ancient *Ayurveda* and its naming system along with basonyms, synonyms might have influenced the Binomial naming system.

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