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INDIA'S NOTABLE PRESENCE IN LINNAEUS' BOTANICAL CLASSIFICATION

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Abstract

Carl Linnaeus proposed a botanical classification based on reproductive organs of the plant, and gave names to 7700 species of plants including several hundred plants from India. He based some generic and several hundred specific epithets on India, its faith and culture, languages, states, towns, rivers, and plants used as food, medicine, and other needs. The paper gives a brief history of major pre-Linnean and Linnean classifications of plants and about 150 examples of generic or specific epithets referring to India.

Key words: Botanical Classification, Etymology, Faith, Food, Language, Medicinal, *Species Plantarum*

1. Introduction

Classifying things into groups, subgroups and still smaller categories and for the purpose of reference giving them some name has been a necessity of life since the early eras. All living things are put into two broad categories called the plant kingdom and animal kingdom. Classification of plants has long history since the work of ancient Greek to modern taxonomy. Theophrastus (370-285 BC) often referred as Father of botany classified plants on the basis of their habit namely, herbs, undershrubs, shrubs and trees[1]. Caesalpino (1519-1603 AD) an Italian botanist and physician, author of *De plantis* gave the description of over 1500 species of plants grouping them into woody and herbaceous habit. He also recognized the characters of fruit, seed and embryo in further grouping of plants. Bauhin (1560-1624) for the first time gave binomial name for plants. A British botanist Ray (1628-1705) divided plants into Dicotyledons and Monocotyledons on the basis of presence of two and one cotyledons respectively. Tournefort (1656-1708) used the character of corolla for classifying plants. Carolus Linnaeus commonly referred as Carl Linne (1707-1778) suggested a system of classification based on reproductive organs of plants and hence called it sexual system. He considered number, union and length of stamens and also the characters of style for classifying plants. In his famous work *Species Plantarum* (1753)[2], he established binomial system of naming plants (that is a generic and specific epithet) and put all plants in 24 classes (such as Monandria, Diandria, Triandria, Tetrandria, Pentandra, Hexandria, Heptandria, Octandria, Enneandria, Decandria, Dodecandria, Icosandria, Polyandria, Didynamia, Tetradynamia, Monadelphia, Diadelphia, Polyadelphia, Syngenesia, Gynandria, Monoecia, Dioecia, Polygamia and Cryptogamia). It was an artificial system as in several cases plants very dissimilar in habit and morphology were put together. Linnaeus did realise this and stated that his system was artificial

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and was meant for easy identification. He did attempt to propose a system based on natural relationships in his later publications. Linnaeus[3] improved his classification to make it more natural in the sixth edition of his *Genera Plantarum* (1764) and appended a list of known 58 natural orders (now referred as Families).

Several other classifications were suggested in between the above mentioned classifications but they were not significantly different. As regards identification and naming of Indian plants, Linnaeus received specimens of animals and plants from various regions of the world including India. He gave names to 7700 species of plants, including several hundred plants from India. Prior to the period of Linnaeus, several accounts of plants in Indian languages and some in English did exist in our country. Relating to Indian region, the important publications before 1753 were by Garcia de Orta's *'Coloquios dos simples'* in 1565[4], P. Hermann's '*Paradiscus Batavus'* in 1698[5], von Rheed's '*Hortus Indicus Malabaricus'* in 1678-1703[6] and Burmann's '*Thesaurus Zeylanicus'* in 1737[7]. Plants occurring in India find mention in many ancient works in Sanskrit, Pali and other languages with their local names of those times. In absence of scientific names, their identity today is sometimes uncertain. Yet, the Sanskrit, Hindi or other Indian names well served the purpose of reference.

2. Linnean Plant Names Referring India

Over 250 Rheedean elements are reflected in descriptions of Linnean plant names from India. A critical analysis of names of genera and species among Linnean names of Indian Plants shows distinct reference to India. Several publications on etymology of scientific, that is Latin names of Indian plants have been useful in preparation of this paper; significant among these are the work of Jain[8], Jain and Singh[9], Manilal[10] and Nayar[11]. Some examples of Linnean plant names which referred to Indian culture, faith, vernacular names, rivers, states, towns, and daily life are listed below:

2.1 Linnean Generic Names

Areca L. '*Atakka'* is the Malayalam name in Kerala for *Areca catechu* L.

Avena L. Latin '*avena'*, oats; derived from Sanskrit "*av*".

Basella L. '*Vasala*' is a Malayalam name in Kerala for *Basella rubra* L. and adapted by Rheede in *Hortus Malabaricus*.

Capparis L. '*Kabra*', Urdu name. The pickled flower buds of *Capparis spinosa* L. are known as Capers.

Carissa L. '*Kṛṣṇa'* in Sanskrit name meaning dark blue or black as the fruits are blackish blue and the shrub (*C. carandus* L.) is called *Kṛṣṇaphala*. In Malayalam it is called "*Karimulla*".

Coffea L. Based on Arabic word '*Quahwah*' for *Coffea arabica* L. '*Kahwa*' is now common word for coffee in india. .

Datura L. '*Dhattura*' is the Sanskrit name for many species of genus.

Indigofera L. Indigo is blue dye from India.

Mangifera L. Derived from '*Manga*', '*Mangai*', Malayalam and Tamil names of fruit of the plant of *Mangifera Indica* L. (*Mango*).

Pavetta L.	'*Pavetta'* is a Malayalam name for *Pavetta indica* L., adopted from Rheede, *Hortus Malabaricus*.
Pistacia L.	*'Pista*' is Indian name for *P. vera* L. (Pistachio), the dry fruit '*Pista*'. The word moved from Persia.
Piper L.	'*Pipuli'* is the Sanskrit name for *Piper longum* L.
Saccharum L.	'*Sarkara*' is Sanskrit name for *Saccharum officinarum* L.
Santalum L.	'*Candana*' is a Sanskrit name meaning fragrant. Persians and Arabs adopted the name '*Shandal*' from Sanskrit name for *Santalum album* L.
Urena L.	'*Urena*' is a Malayalam name, which Rheede used in *Hortus Malabaricus* for *Urena lobata* L.

2.2 Legend

Ficus religiosa L.	Associated with Indian religions particularly in Hindu and Baudh faith
Ocimum sanctum L.	It is a sacred plant

2.3 Indian Languages

Amomum cardamom L.	(=*Elettaria cardamomum* (L.) Maton) this is cardamom '*Elaci*', called in Malayalam '*Elettari*'
Averrhoa bilimbi L.	'*Bilimbi*' is Malayalam name of the plant
Averrhoa carambola L.	'*Carambola*' is name in Rheedes work
Avicennia oepata L.	'*Oepata*' is the Malayalam name of the plant)
Capparis baducca L.	'*Baducca*' is the Malayalam name of the plant
Carica papaya L.	(Hindi-*Papeeta*, Pepo)
Carissa carandas L.	'*Karonda*' is Hindi name of the plant
Convolvulus scammonia L.	*Skammonia* is Hindi name of the plant
Eugenia jambos L.	(=*Syzygium jambos* (L.) Alston) *Jamrul*, *Jam*, in Indian Languages
Euphorbia tirucalli L.	'*Tiru*' is the Malayalam name of the plant
Guilandia moringa L.	'*Morungu*' is the Malayalam name of the plant
Helicteres isora L.	'*Isora Murri*' is the Malayalam name of the plant
Kaempferia galanga L.	'*Kacholakilangu*' Tamil name of the plant
Michelia champaca L.	'*Champa*' is the Hindi name of the plant
Mimusops elengi L.	*'Elengi'* is the Malayalam name of the plant
Nicotiana tabacum L.	'*Tambaku*' is Indian name
Ophiorrhiza mungos L.	Marathi='*Mung-usavela*', Gujrati= '*Mungusvel*' and Kanada = '*Mungisigida*'

Peganum harmala L. '*Harmal*' is Hindi name of the plant

Phaseolus mungo L. (=*Vigna mungo* (L.) Hepper) (Hindi name related to pulses)

Rhizophora candel L. '*Tsierou-kandel*' is the Malayalam name of the plant

Vitex negundo L. '*Nirguṇḍi*' is Hindi and Sanskrit name of the plant

2.4 India

Acalypha indica L.

Aeginetia indica L.

Aeschynomene indica L.

Aira indica L. (=*Sacciolepis indica* (L.) Chase)

Alopecurus indicus L.

Anthoxanthum indica L.

Anthoxanthum indicum L. (=*Perotis indica* (L.) Kuntze)

Aristolochia indica L.

Aspalathus indica L.

Aster indicus L.

Baccharis indica L.

Bignonia indica L. (= *Oroxylum indicum* (L.) Vent.)

Borago indica L. (= *Trichodesma indicum* (L.) Sm.)

Canna indica L.

Carex indica L.

Chrysanthemum indicum L. (=*Dendranthema indicum* (L.) Des Moul.)

Clerodendrum indicum L.

Crataegus indica L. (=*Rhaphiolepis indica* (L.) Lindl. ex Ker Gawl.)

Cyclamen indicum L.

Cynosurus indicus L.

Daphne indica L. (=*Wikstroemia indica* (L.) C. A. Mey)

Dillenia indica L.

Dodartea indica L.

Drosera indica L.

Erythrina indica L.

Flagellaria indica L.

Heliotropium indicum L.

Houttonia indica L. (=*Limnophila indica* (L.) Druce)
Inula indica L. (=*Pentanema indicum* (L.) Y. Ling.)
Lagerstroemia indica L.
Leea indica L.
Mangifera indica L.
Menyanthes indica L.
Morus indica L.
Nepeta indica L. (= *Anisomeles indica* (L.) Kuntze)
Panicum indicum L.
Pavetta indica L.
Periploca indica L. (=*Hemidesmus indicus* (L.) R.Br.)
Plumbago indica L.
Quisqualis indica L.
Rosa indica L.
Salvia indica L.
Saraca indica L.
Sesamum indicum L.
Sida indica L. (=*Abutilon indicum* (L.) Sweet)
Sisymbrium indicum L. (=*Rorippa indica* (L.)Hiern.)
Solanum indicum L.
Sphaeranthus indicum L.
Tamarindus indica L.
Trifolium indicum L. (=*Meliotus indica* (L.) All.)
Vateria indica L.
Waltheria indica L.
Xyris indica L.
Zanonia indica L.

2.5 Regions

Convoluvolus malabaricus L.	Malabar is the coastal region in west of Penninsula
Malva coromandeliana L.	(=*Malvastrum coromandelianum* (L.) Garcke) Coromandal is eastern region of Penninsula
Nepeta malabarica L.	(=*Anisomeles malabarica* (L.) R. Br. ex Sims)

2.6 States

Banisteria bengalensis L.	(=*Hiptage bengalensis* (L.) Kurz) (Bengal is a state in Eastern India)
Commelina benghalensis L.	
Ficus bengalensis L.	
Illecebrum bengalense L.	

2.7 Towns

Cucumis maderaspatanus L.	(=*Melothria maderaspatana* (L.) Cogn.) (Madras formerly name of state, capital town now named Chennai)
Hibiscus surattensis L.	Surat town in Gujrat
Phyllanthus maderaspatensis L.	

2.8 Rivers

Amaranthus gangeticus L.	Ganges is longest river in India
Convolvulus gangeticum L.	
Hedysarum gangeticum L.	(=*Desmodium gangeticum* (L.) DC)
Justicia gangetica L.	(=*Asystasia gangetica* (L.) T. Andson)

2.9 Food

Arum esculentum L.	(=*Colocasia esculenta* (L.) Schott) (*esculentus* means edible)
Hibiscus esculentus L.	(=*Abelmoschus esculentus* (L.) Monch.)
Averrhoa acida L.	(=*Cicca acida* (L.) Merr.) (leaves and fruits with acidic taste/sourare edible)

2.10 Medicine

Allamanda cathartica L.	(*cathartic*=strong purgative)
Althaea officinalis L.	(*officinalis*= used in medicine, officinal= a drug shop)
Antidesma alexiteria L.	(*Alexin*= a substance which kills germs)
Asparagus officinalis L.	
Avicennia officinalis L.	
Borago officinalis L.	
Calendula officinalis L.	
Citrus medica L.	(*medica* refers to medicinal use)
Euphrasia officinalis L.	

Fumaria officinalis L.
Guaiacum officinale L.
Hyssopus officinalis L.
Jasminum officinale L.
Lavendula officinalis L.
Lithospermum officinalis L.
Melissa officinalis L.
Paeonia officinalis L.
Phyllanthus urinaria L. (used for diuretic property)
Rosmarinus officinalis L.
Salvia officinalis L.
Saponaria officinalis L.
Valeriana officinalis L.
Verbena officinalis L.

2.11 Dye

Carthamus tinctorius L. (Red dye)

Indigofera tinctoria L. (Blue dye) (*tinctorius* meaning used in dyeing)

2.12 Aromatic/Spices and Condiments

Anethum graveolens L.

Caryophyllus aromaticus L. (=*Syzygium aromaticum* (L.) Merr. & Perry), it is common 'clove'

Ruta graveolens L. (*graveolens* meaning strong smelling)

3. Discussion

The largest number of specific epithets are based on the name India. It was natural because Linnaeus was handling specimens from the whole world, and he must have chosen to first give the specific epithets *indica, indicum or indicus* to plants from India. When this epithet was preoccupied in that genus he gave other epithet based on morphological feature, existing local name for the plant (as in some name based on Rheede's work), or any mythological association (like *religiosa, sanctum*), etc.

Authors' limitations: Authors' familiarity only with Hindi Language limit interpretation of names of possible origin from other Indian Languages. Names based on Malayalam words have been well discussed by Manilal[10]. Readers familiar with other languages can trace root of several other specific names given by Linneaus.

Interpretation of more specific epithets in Linnaean binomials showing relation with land, life, languages and legends of India will further strengthen the inference that the legacy of this great biologist, Carl Linnaeus is immortal and deep rooted in Indian bio-cultural diversity.

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