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Synonymy in sanskrit plant names: Conflicts and causes

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Abstract
Names, whether common or scientific, act an effective shorthand for the objects (living or non-living) in our surrounding. Accurate scientific identification of plants is the first necessity before embarking upon any application on them. A single common name in Sanskrit for different plants is a common experience. These names have been christened in different periods of time by different authors and experts since Vedic period. The long-standing problem of accurate identities of plants in Sanskrit literature is yet to receive adequate and serious attention. The present authors focussed some select synonyms of plants in Sanskrit and endeavoured to evaluate the reasons for the said conflict. Earlier history of chronological gaps between the various Sanskrit treatises is presented in bird's eye-view. As many as 12 criteria for synonymy are presently brought out in a clearer focus. A need for resolving the conflict arose due to synonymy is felt involving collaborative investigations by the experts in Sanskrit and plant science.

Keywords: sanskrit plant names, synonymy, conflicts, causes

Introduction
Mankind has a natural instinct of naming objects, whether living or nonliving, in his Surrounding. Such names have been christened in all languages or dialects. These names are called common names, local names, native names, vernacular names, etc. There is not a set of rules for such nomenclature and hence they differ regionally and also from language to language, dialect to dialect and even within them. In such circumstances, it is quite possible that the same plant species have more than one names or the same name is given two or even more unrelated plant species. The present authors and their associates paid attention to Sanskrit common plant names (Patil, 2017; 2018a,b; 2019a,b,c; 2020a,b,c; Patil and Tayade, 2017) [15, 6, 9, 11, 15]. However, the names were analysed for their origin, use-reports and ecological information embedded in them. This communication is directed to a situation when some Sanskrit name is used for different plant species. A name which has the same application, reference or meaning as another is called synonym. We know, Sanskrit is a standardized oldest language of Indo-Aryan origin. Presently, it is language of no nation. Substantial ancient written records of its utility still exists, although it is moribund since long. Plants have received Sanskrit common names. It is to be noted that we are distanced physically or psychologically from the natural environment so that our experience of plant names may be poorer than it has been for generations. Plants with more than one common Sanskrit names are being focussed in this communication to interpret the difficulty of synonymy in Sanskrit plant names citing some select examples.

Methodology
Sanskrit plant names have been borrowed from different treatises and publications. They are equated with recent botanical names and families. These literary sources are mentioned against each species in the Table-I alongwith their habit and status regarding wildness or cultivation. For the sake of scientific determination, national, state or regional floras have been consulted (Hooker, 1872-1897; Cooke, 1958; Sharma *et al*., 1996; Singh *et al*., 2000, 2001; Naik, 1998; Sharma *et al*., 1993; Sharma and Balkrishnan, 1993; Sharma and Sanjappa, 1993, etc.) [3, 1, 20, 23- 22, 5, 17- 18- 19, 17- 18- 19].

Table 1: Select Synonyms of Sanskrit Plant Names

Sr. No. (1)	Sanskrit plant Plant Name (2)	Botanical Names & Literary Sources (3)	Family (4)	Status Wild (W)/ Cultivated (C) (5)	Habit (6)
1.	Jivanti	(i) *Holostemma ada-kodien* Schultes (Syn. *H.annulare* (Roxb.) K.Schumn. Warrier *et al*. (1995), Sivarajan & Balachandran (1994)	Asclepiadaceae	W	Climber
		(ii) *Leptadenia reticulata* (Retz.) W. & A. Singh (2008); Sivarajan & Balchandran (1995)	Asclepiadaceae	W	Climber
		(iii) *Dendrobium macraei* Lindl. Desai (1975)	Orchidaceae	W	Herb
		(iv) *Amaranthus paniculatus* Linn. Patil (2017)	Amaranthaceae	W	Herb
		(v) *Flickingenia nodosa* (Dalz.) Seiden *f*. Srinivasan & Balchandran (1994)	Orchidaceae	W	Herb

2.	Pushkar, Puskaram, Puskarmul	(i) *Inula racemosa* Hook. *f.* Warrier *et al*. (1995)	Asteraceae	W	Herb
		(ii) *Iris germanica* L. Desai (1975)	Iridaceae	C	Herb
3.	Dronapuspi	(i) *Leucas aspera* (Willd.) Link. Warrier *et al*. (1995)	Lamiaceae	W	Herb
		(ii) *Leucas cephalotes* (Roth.) Spreng. Desai (1975)	Lamiaceae	W	Herb
4.	Malati	(i) *Jasminum grandiflorum* Linn. [Syn. *J.officinale* form grandiflorum (Linn.) Kobuski] Warrier *et al*. (1995); Singh (2008); Sivarajan & Balachandran (1994)	Oleaceae	Climber	C
		(ii) *Aganosma dichotoma* (Roth.) Schum. (Syn.*A. caryophyllata* G.Don.) Desai (1975)	Apocynaceae	Climber	W
5.	Jivak, Jivakah	(i) *Malaxis acuminata* D. Don. Warrier *et al*., (1975)	Orchidaceae	Herb	W
		(ii) *Orchis latifolia* Linn. Desai (1975)	Orchidaceae	Herb	W
6.	Murva	(i) *Chonemorpha fragrans* (Moon) Alston Warrier *et al*. (1994)	Apocynaceae	Climber	W
		(ii) *Clematis triloba* Heyne ex Roth. Desai (1975)	Ranunculaceae	Climber	W
		(iii) *Marsdenia tenacissima* (Roxb.) Moon	Asclepiadaceae	Climber	W
		(iv) *Argeria nervosa* (Burm. *f*.) Boj. Sivarajan & Balachndran (1994)	Convolvulaceae	Climber	W
7.	Indravaruni	(i) *Cucumis trigonus* Roxb. Warrier *et al*. (1994)	Cucurbitaceae	Climber	W
		(ii) *Citrullus colocyntis* (Linn.) Schrad Singh (2008); Desai (1975); Srivarajan & Balchandran (1994)	Cucurbitaceae	Climber	W
8.	Musali	(i) *Curculigo orchioides* Gaertn. Warrier *et al*. (1994); Shivrajan & Balachandran (1994)	Hypoxidaceae	Herb	W
		(ii) *Asparagus adscendens* (Roxb.) Kunth. Desai (1975)	Liliaceae	Herb	W
9.	Patha Lagupath	(i) *Cyclea peltata* (Lam.) Hook. *f*. & Thoms. (Syn.*C.burmanni* Hook. *f*. Thoms.) Warrier *et al*. (1984)	Menispermaceae	Climber	W
		(ii) *Cisampelos pariera* Linn. var.*hirsuta* [Buch.-Ham.ex (DC.) Forman] (Syn.*C.pariera* Linn.)	Menispermaceae	Climber	W
		(iii) *Cissampelos pariera* Linn. Patil (2020c)	Menispermaceae	Climber	W
		(iv) *Stephania japonica* (Thunb.) Miers. Sivrajan & Balchandran (1994)	Menispermaceae	Climber	W
10.	Rasna, Rasona, Rasonah	(i) *Alpinia galanga* (Linn.) Willd. Warrier *et al*. (1994); Sivrajan & Balachandran (1994)	Zingiberaceae	Herb	W
		(ii) *Alpinia calcarata* Rosc. Sivrajan & Balachandran (1994)	Zingiberaceae	Herb	W
		(iii) *Inula racemosa* Hook. *f*. Desai (1995)	Asteraceae	Herb	W
		(iv) *Allium sativum* L. Patil (2019a, c)	Liliaceae	Herb	C
11.	Shatapushpa	(i) *Anethum graveolens* linn. (Syn.A.sowa Roxb. ex. DC.) Warrier *et al*., (1994)	Apiaceae	Herb	C
		(ii) *Fonoeculum vulgare* Mill. Singh (2008); Desai (1995); Patil (2020b); Patil (2019c); Patil (2017)	Apiaceae	Herb	C
12.	Danti	(i) *Baliospermum solanifolium* (J.Burm.) Suresh (Syn.*B.montanum* (Willd.) Muell.Arg. Warrier *et al*. (1994) Sivarajan & Balachandran (1994)	Euphorbiaceae	Shrub	W
		(ii) *Croton polyandrum* _____ Desai (1975)	Euphorbiaceae	Shrub	W
13.	Priyangu	(i) *Callicarpa macrophylla* Vahl. Warrier *et al*. (1994); Singh (2008)	Verbenaceae	Shrub	W
		(ii) *Aglaia elaeognoidea* (A.Juss.) Benth. (Syn.*Aglaia priyangu* _____) Desai (1975)	Meliaceae	Tree	W

14.	Shankhapushphi, Sankhapuspi	(i) *Evolvulus alsinoides* (Linn.) Linn.	Convolvulaceae	Herb	W
		(ii) *Clitorea ternatae* Linn.	Papilionaceae	Climber	W,C
		(iii) *Convolvulus pluricaulis* Chois	Convolvulaceae	Climber	W
		(iv) *Canscora decussata* (Roxb.) Schutt. Sivarajan & Balachandran (1994); Warrier *et al*. (1994)	Gentianaceae	Herb	W
15.	Pashanabheda	(i) *Rotula aquatica* Lour	Boranginceae	Herb	W
		(ii) *Homonoia riparia* Lour. Patil (2020a)	Euphorbiaceae	Shrub	W
16.	Padwa	(i) *Nelumbo nucifera* Gaertn.	Nymhaeaceae	Herb	C
		(ii) *Premna integrifolia* L. Sensarma (1992)	Verbenaceae	Shrub	W
17.	Amrta	(i) *Tinospora cordifolia* (Willd.) Miers.	Menispermaceae	Climber	W
		(ii) *Tragia involucrata* L.	Euphorbiaceae	Herb	W
		(ii) *Clitorea ternatea* L. Sivarajan & Balchandran (1994); Sensarma (1992)	Papilionaceae	Climber	W, C
18.	Asvattha	(i) *Ficus religiosa* L.	Moraceae	Tree	W, C
		(ii) *Emblica officinalis* Gaertn. Sensarma (1992)	Euphorbiaceae	Tree	W, C
19.	Brahmi	(i) *Solanum melongena* L.	Solanaceae	Shrub	C
		(ii) *Centella asiatica* (L.) Urb.	Apiaceae	Herb	W
		(iii) *Bacopa monnieri* (L.) Wettst. [Syn.*Harpestis monniera* (L.) Kunth.] Sivarajan & Balchandran (1994); Sensarma (1992); Desai (1975); Sivarajan & Balachandran (1994)	Scrophulariaceae	Herb	W
20.	Dhatri	(i) *Emblica officinalis* Gaertn.	Euphorbiaceae	Tree	W, C
		(ii) *Barringtonia acutangula* (L.) Gaertn. Sensarma (1992); Singh (2008)	Lycithidaceae	Tree	W
21.	Hingu	(i) *Ferrula asafoetida* Boiss.	Apiaceae	Shrub	W
		(ii) *Abrus precatorius* L. Sensarma (1992); Singh (2008); Warrier *et al*. (1995); Patil (2020b,c); Patil (2019a).	Papilionaceae	Climber	W
22.	Kumkuma, Kumkum, Kunkumam	(i) *Crosus sativus* L.	Iridaceae	Herb	C
		(ii) *Carthamus tinctorius* L. Singh (2008); Sensarma (1992); Desai (1975); Warrier *et al*. (1994); Patil (2019b); Patil (2019c)	Asteraceae	Herb	C
23.	Madhuka, Madhuk, Madhukah	(i) *Madhuca longifolia* (Koenig) Macbr.	Sapotaceae	Tree	W, C
		(ii) *Glycyrrhiza glabra* L. Singh (2008), Sensarma (1992); Warrier *et al*. (1995); Desai (1975); Patil (2018b); Patil (2017); Patil (2019c)	Papilionaceae	Herb	W
24.	Visva	(i) *Allium sativum* L.	Liliaceae	Herb	C
		(ii) *Tinospora cordifolia* (Willd) Miers. Sensarma (1992)	Menispermaceae	Climber	W
25.	Meshasringi, Meshasrnga	(i) *Gymnema sylvestre* (Retz.) R.Br.ex Sm.	Asclepiadaceae	Climber	W
		(ii) *Dolichondrone falcata* (Wall. ex DC.) Seem	Bignoniaceae	Tree	W
		(iii) *Prosopis spicigera* Linn. Thomas *et al*. (2020); Warrier *et al*. (1995); Desai (1995); Singh (2008); Patil (2020a); Patil (2018a)	Mimosaceae	Tree	W
26.	Rata	(i) *Ixora coccinea* L.	Rubiaceae	Shrub	W, C
		(ii) *Pterocarpus santalinus* L. Sensarma (1992); Patil and Tayade (2017)	Papilionaceae	Tree	W
27.	Derbhan	(i) *Desmostachys bipinnata* (Linn.) Stapf. [Syn.*Eragrostis cynosuroides* (Retz.) Beauv.]	Poaceae	Herb	W
		(ii) *Imperata cylindrica* (Linn.) P.Beauv. (Syn.*I.arundinaceae* Cyr.) Sivarajan & Balachandran (1994)	Poaceae	Herb	W
28.	Bala	(i) *Sida cordifolia* Linn.	Malvaceae	Herb	W
		(ii) *Sida rhombifolia* Linn. var. *retusa* (Linn.) Mast. Sivarajan & Balchandran (1994)	Malvaceae	Herb	W
29.	Atibala	(i) *Abutilon indicum* (Linn.) Sweet	Malvaceae	Shrub	W
		(ii) *Abutilon hirtum* (Lam.) Sweet	Malvaceae	Shrub	W
		(iii) *Urena lobata* Linn. Sivrajan & Balchandran (1994)	Malvaceae	Herb	W
30.	Duralabha	(i) *Tragia involvucrata* Linn.	Euphorbiaceae	Herb	W
		(ii) *Fagonia arabica* Linn.	Zygophyllaceae	Undershrub	W
		(iii) *Alhagi pseudalhagi* (Bieb.) Desv. Sivarajan & Balchandran (1994	Papilionaceae	Shrub	W
31.	Kiratatiktah	(i) *Andrographis paniculata* (Burm. *f*.) Wallich ex	Acanthaceae	Herb	W

		Nees			
		(ii) *Swertia chirayita* (Roxb. ex Flem.). Karsten Sivarajan & Balchandran (1994)	Gentianaceae	Herb	W
32.	Padmacarini	(i) *Hybanthus enneaspermus* (L.*f*.) Muell. Nadkarni (1954)	Violaceae	Herb	W
		(ii) *Habenaria grandiflora* Lindl. ex Dalzell & Gibson Vaidya (1936)	Orchidaceae	Herb	W

Results and Discussion

Synonyms of Sanskrit plants enlisted in the Table-I indicate certain facts. These are presented herewith: (1) Quite unrelated plant species under one common name: e.g. Jivanti, Murra, Shankaushpi, Kumkuma, Meshashringi, etc. (2) Plants belonging to the same genus: e.g. Dronpuspi, Bala. (3) Plants belonging to the same family: e.g. Jivak, Patha, Shatapushpa, Darbhah, Atibala, Indravaruni. (4) Same underground part e.g. Musali. (5) Similar utility: e.g. Danti. (6) Similar habits: e.g. Pashanbheda, Kumkuma. (7) Similar taste: e.g. Madhuka. (8) Similar appearance of fruits: e.g. Meshasring. (9) Similar colour exhibition by plant parts: e.g. Rakta. (10) Similar property: e.g. Kiratakiktah. (11) Similar religious utility: e.g. Darbhah. (12) Plants causing inconvenience to mankind: e.g. Duralabha (spines or stringing hairs). These Sanskrit plant common names have historical, cultural or other associations that would a pity to lose. Therefore, they have general appeal. It is doubtless that they will be used in future also. These names were not imposed by any law or act. They arose when a need was experienced by the concerned society. When there is a single common name for a species is referred or known by multiples names, it causes controversy. To achieve mastery over forces of nature, mankind has ever turned to plant for sustenance. These plants are to be identified by every generation. Modern plant taxonomy serves three functions *viz*., classification, nomenclature and identification. The last function obviously demands expertise in morphology. When a subject matter relates to ancient literature that too in a morbid language like Sanskrit, then it is pertinent to have at least a brief review about the development and genesis of taxonomy. The period of documentation of plants can be broadly divisible as: (i) Vedic Period (4000 BCE-1500 BCE), (ii) Samhita period (1500 BCE-7th Century), (iii) Medieval period (8th- 15th Century) and (iv) Modern period (16th Century onwards). Plant species are recorded in Rigveda (67) Yajurveda (82) and Atharveda (288). Ayurveda (thought Upaveda of Atharveda) and even Upunishads (31) contain plant records. Figures in parenthesis denote number of plant species. Samhitas are the next in order of information. Caraka (Charaka) Samhita (1000 BCE-200 CE) include 620 species, while Sushruta Samhita (15 BCE-1000 BCE) inform on 775 species. Samhitas provide plant-uses, pharmacology, method of collection, parts used and classifications. There are a few other Samhitas *viz*., Ashtanga Samgraha (500 CE), Ashtanga Hridaya (60 CE). Some Samhitas are availabe after 700 CE e.g. Harita Samhita, Bhela Samhita, Kashyapa Samhita, Sharangadhara Samhita and Bharaprakasha Samhita. Chronologically next source of information on plant is recorded *in viz*., Vyakhyas (commentaries on Samhitas) and Nighantus (glossaries based on Samhitas). Sixteen Nighantus are written during 8th to 19th centuries. Since, 16th century, Europeans attempted documentation of Indian biodiversity. Their works started when there was also no established system of plant classification available to them (pre-Linnean period). In later period, they provided plant illustrations, morphological descriptions (in Latin) and naming. However, they did not attempt to correlate Sanskrit plant names and synonyms as mentioned in Ayurveda (pristine science in life) or earlier scripts. Certain facts have surfaced from the in-depth study of the aforesaid literary sources of Indian plants. These are: (a) There is a long chronological gaps in between these sources. (b) This obviously affected identity *vis-a-vis* synonymy of plants in various works. (c) There was no set of rules for naming of plants, and hence plant names were coined depending upon the limited observations of the coiner, besides his interest or caprice. (d) Therefore, plant names also went on changing with period of time and development in plant science. (e) Parasara (1st Century BC or 1st Century AD) attempted at scientific classification of plants based on morphological criteria (c*f*. Sircar and Sarkar, 1996). His mission was not carried further by the subsequent authors in plant science. (f) Because of time gaps, there appeared knowledge loss. The information embedded in ancient Sanskrit literature was established on three criteria *viz*. pratyaksa (direct perception), anumana (inference) and aptopudesa (words of seers). Moreover, this knowledge has passed on the next generations by word of mouth. There is also possibility of generation gaps during which the knowledge is lost.

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