Plantae Scientia – An International Research Journal in Botany Publishing Bimonthly Open Access Journal

Plantae Scientia: Volume 07, Issue 04, 2024

ISSN 2581-589X

REVIEW ARTICLE

Limelighting Plant Invasion in India Through the Gleanings of Bhela Samhita

Patil, D.A.

Post-Graduate Department of Botany,
S. S. V. P. Sanstha's L.K. Dr. P.R. Ghogrey Science College, Dhule-424005 (M.S.), India.
**Corresponding Author:* dapatil_10aug@yahoo.com

Manuscript Details

Manuscript Submitted : 17/05/2024
Manuscript Revised : 16/06/2024
Manuscript Accepted : 20/06/2024
Manuscript Published : 15/07/2024

Available On
https://plantaescientia.com/ojs

Cite This Article As
Patil D.A. (2024). Limelighting Plant Invasion in India Through the Gleanings of Bhela Samhita. *Pla. Sci.* 2024; Vol. 07 Iss. 4:37-45

DOI-

https://doi.org/10.32439/ps.v7i4.37-45

Copyright

© The Author(s). 2024. Open Access
This article is distributed under the terms of the Creative Commons Attribution 4.0 International License
http://creativecommons.org/licenses/by/4.0/

Indexed In

CrossRef, Scientific Indexing Services (SIS), Google Scholar, Index Copernicus International (ICI), Directory of Research Journal Indexing (DRJI), CiteFactor, Scientific Journal Impact Factor (SJIF), General Impact Factor, Journal Factor, Cosmos Impact Factor, AJIFACTOR Indexing, etc.

ABSTRACT

Developing nations like India are struggling in present time to conserve and manage biodiversity in a sustainable manner. However, prior to this movement, we must have information regarding status and changing patterns of biodiversity. The present author is engaged revealing floral elements invaded in Indian subcontinent. At this background, the present is an attempt to limelight exotic plant diversity through the lens of ancient scripture *viz*., Bhela Samhita which is rich in Sanskrit plant names of medicinal significance. This Samhita informs about 286 medicinal plant species. Out of these, a total of 98 exotic species are revealed belonging to 89 genera and 49 families of angiosperms. The dicotyledonous species have fairly invaded in India as compared to the monocotyledons. Their habital categorization and status regarding wildness or cultigen is also revealed along with their nativities in the world. The sum total of evidences may be of utility in view of biodiversity management and its conservation in India.

Keywords: Bhela Samhita, Exotic Plants, Plant Invasion, India.

INTRODUCTION

Bhela Samhita originally composed by the eminent exponent Bhalacharya of post-Vedic period (100 BC.-400BC.) Earlier, this Samhita was called Bhelatantra but later on named as Bhela Samhita. He is thought belonging to the present-day Kandhar. He worked at various places in Punjab, Rajasthan, Iran, Afghanistan, Kashmir, Haryana, etc. The original manuscript was found in the Tanjore Maharaja Serfoji's Saraswati Mahal Library, Thanjavur in South India. The present author thought it worth revealing plant-wealth contained in it from the viewpoint of plant invasion in India especially in such ancient past. The results of this scrutiny are being presented in this account.

METHODOLOGY

One of the ancient classic treatises in Sanskrit is the Bhela Samhita. It contains information about medicinal plants composed by Bhelacharya. To reveal plant diversity, the scriptures *viz*., (i) Bhela Samhita by Bhelacharya (1977) and (ii) Bhela Samhita by Sharma (2000) have been scrutinized. The Sanskrit plant names are studied finding out their correct Latin (botanical) name and assigning to their respective families. Their exotic status is also determined consulting relevant taxonomic literature as mentioned against such species enumerated in the Table-I. The exotic plant species are discussed from the standpoint of plant invasion (bioinvasion) in India in the ancient period.

RESULTS & DISCUSSION

Bhela Samhita is one of the significant treatises of Ayurveda, the science of life in India. It has a notable contribution in medicare and worth to study its medicinal diversity with a particular interest in plant invasion in Samhita period of India. There are 419 Sanskrit plant names in this treatise. These can be equated with total 286 medicinal plant species, avoiding synonyms. This inventory revealed exotic medicolore pertaining to a total of 98 species, 89 genera and 49 families of angiosperms. Of these, the dicotyledons have maximum share in bioinvasion in the then India (845 species, 81 genera and 45 families), whereas the monocotyledons contributed for the same phenomenon a little role (14 species, 09 genera, 05 families). They belong to different categories of plant habits *viz*., trees (23), shrubs (12), climbers (10) and herbs (53). The herbaceous exotic floral elements predominated in bioinvsion. These taxa are wild (31), cultivated (65) and wild or cultivated (02). The figures in parenthesis stand for number of species. Majority of species being cultivated, are obviously brought in India for medicinal purpose, the wild ones have invaded India unintentionally or naturally and form an integral part of Indian biodiversity. Various geographical regions of their origin or home are limelighted. They belong to different continents, countries, islands and specific biographical areas. They pertain to: Africa (34), Asia (Excl. India) (30), America (22), Europe (21), Australia (03), Mediterranean Region (11), China (12), Japan (06) Arabia and Persia (04 each), Brazil, Asia Minor and West Indies (03 each), Middle East and Malaysia (02 each). The other regions *viz*., Argentina, Tibet, Mexico, Taiwan, Ceylon (Sri Lanka), Greece, Syria, Jamaica, Persian Gulf, Turkestan, Balken Peninsula, Myanmar, Moluccas, Cochin China, Tropic and Subtropics, etc. contributed a single species each.

In the modern era, cultural diversity is linked with biological diversity as a basis of its conservation. Prior to embarking upon biodiversity management and its conservation, it is essential to knowing status of biodiversity of a region. This attempt revealed a fund of data about exotic plants invaded in India in past. This will help resolve to some extent problems of biodiversity management and conservation in future.

ACKNOWLEDGEMENTS

Author is thankful to the authorities of S.S.V.P. Sanstha for library and laboratory facilities extended.

REFERENCES

Almeida, M.R. (1996) Flora of Maharashtra Vol.I. Orient Press, Mumbai, Maharashtra, India.

Almeida, M.R. (1998) Flora of Maharashtra (Fabaceae To Apiaceae) Vol.2. St.Xavier College, Orient Press, Mumbai, Maharashtra, India.

Almeida, M.R. (2001a) Flora of Maharashtra (Rubiaceae To Ethretiaceae) Vol.3A. St.Xavier College, Orient Press, Mumbai, Maharashtra, India.

Almeida, M.R. (2001b) Flora of Maharashtra (Cuscutaceae To Martyniaceae) Vol.3B. St.Xavier College, Orient Press, Mumbai, Maharashtra, India.

Almeida, M.R. (2009a) Flora of Maharashtra (Hydrocharitaceae To Typhaceae) Vol.5A. St.Xavier College, Orient Press, Mumbai, Maharashtra, India.

Almeida, M.R. (2009b) Flora of Maharashtra (Araceae To Cyperaceae) Vol.5B. St.Xavier College, Orient Press, Mumbai, Maharashtra, India.

Babu, C.R. (1977) Herbaceous Flora of Dehra Dun. Publication And Information Directorate, CSIR, New Delhi, India.

Backer, C.A. and R.C.B. Brink Jr. (1963) Flora of Java. Vol.I. P. Noordhoff, N.V. Gronangen.

Bailey, L.H. (1928) The Standard Cyclopedia of Horticulture (England Edition) Vol.I, The Macmillan Co., New York, USA.

Bailey, L.H. (1949) Manual of Cultivated Plants (Rev.Ed.) Macmillan, New York, USA.

Bhandari, M.M. (1978) Flora of The Indian Desert. Scientific Publishers, Jodhpur, India.

Castillo, C.C., Bellina, B. and D.Q.Fuller (2016) Rice, beans and trade crops on the early maritime silk route in South-East Asia. Antiquity Publication Ltd. pp.1255-1269.

Chandra Sekar K. (2012). Invasive alien plants of Indian Himalayan region: Diversity and implication. American Journal of Plant Sciences. 3:177-184.

Chaphekar, S.B., Lattoo, C. and M.D. Karnik (2007) Sen'trees' of Mumbai. Centre For Extra-Mural Studies, University of Mumbai, Fort, Mumbai, Maharashtra, India-400032, India.

Cooke, T. (1958) The Flora of The Presidency of Bombay. Vol.I-II (Repr.Ed.). Bot.Surv.India, Calcutta, India.

Dar, G.H., Bhagat, R.C. and M.A.Khan (2002) Biodiversity of The Kashmir Himalaya, Valley Book House, Srinagar, India.

De Candolle A. (1959) Origin of Cultivated Plants (Rev. 2nd Ed.) Hafner Publishing Co., London, UK.

Deb, D.B. (1983) Flora of Tripura State. Vol.II, Today & Tomorrow's Printers and Publishers, New Delhi, India.

Debnath A. and Debnath B. (2017). Diversity, invasion status and usages of alien plant species in Northeastern Hilly State of Tripura: A confluence of Indo-Barman Hotspot. American Journal of Plant Sciences 8:212-235.

Dogra, K.S. (2011) Alien plants distribution and ecology in the temple-courtyards of Himachal Pradesh (N.W.Himalaya). Himachal Pradesh University Journal, July:1-11.

Gaikwad, S.P. and K.U. Garad (2015) Flora of Solapur (Maharashtra). Laxmi Book Publications, Solapur, Maharashtra, India.

Gopalswamiengar, K.S. (1991) Complete Gardening in India (4th Ed.) Gopalaswamy Parthasarathy, 'Srinivasa', 5th Road, Chamarjapet, Bangalore, India.

Graf, A.B. (1980) Exotica: Pictorial Cyclopedia of Exotic Plants from Tropical and Near-Tropic Regions. Roders Company INC., USA (10th Ed.)

Helback, H. (1965) Isin-Larson and Horian food remains at Tell. Bazmosian in the Dokan Valley Summer (Baghadad) 19:27-35.

Hewson, H.J. and H.S. Thompson (1993) (Ed.) Flora of Australia: Oceanic Islands-2. Vol.50. AGPS Press Publication, Australian Government Publishing Service, Canberra.

John Cameron (1891) Catalogue of Plants in The Botanical Garden, Bangalore and Its Vicinity (2nd Ed.). Mysore Government Central Press, Bangalore, India.

Karita, G., Singha, D.Nr. and S.K.Sarma (2019) Exotic invasion plants (Aquatic and ecotone) of Nalbari district of Assam. International Journal of Pharmacy and Biological Science 9(3):954-965.

Kaul, M.K. (1986). Weed Flora of Kashmir Valley. Scientific Publishers, Jodhpur, India.

Kislev,M.E. (1989) Origins of the cultivation and Lathyrus sativus and L. cicera (Fabaceae) Economic Botany 43(2):262-270.

Kshirsagar, S.R. and D.A. Patil (2008) Flora of Jalgaon District (Maharashtra) Bishen Singh Mahendra Pal Singh, Dehradun, Uttar Praesh, India.

Lesley, H. (2020) Invasive Alien Plants In South Africa. Department of Environmental Affairs, Republic of South Africa.

Martin, F.W., Campbell C.W. and Ruberte, R.M. (1987). Perennial edible plants of the tropics: An inventory. U.S. Department of Agriculture, Agriculture Handbook No.642. 222p.illus.

Matthew, K.M. (1991). An Excursion Flora of Central Tamil Nadu, India. Oxford & IBH Publishing Co.Pvt. Ltd. New Delhi, India.

Medakkar, S.S. and P.P. Sharma (2016a) Antiquity of some exotic plants in India. The South Asian Academic Research Chronicle Vol.III (6) June: 6-14.

Medakkar, S.S. and P.P. Sharma (2016b) Some exotic plants in human consumption and Ahmednagar district, Maharashtra. International Journal of Current Research 8(7):35433-35436.

Medakkar, S.S. and P.P. Sharma (2016c) Less-known uses of some exotic plants from Ahmednagar district, Maharashtra Part-II (E-Z). Int.J.Pure App. Biosci. 4(4):154-158.

Medakkar, S.S. and P.P.Sharma (2016d) Less-known uses of some exotic plants from Ahmednagar district, Maharashtra: Part-I. (A-D). *Int. J. Pure App. Biosci.* 4(3):182-187.

Mukhopadhyay, D.P. and R.K. Chakraverty (2008) Plant Wealth of The Raj Bhavan, Kolkata. Occasional Paper-5 From Raj Bhavan, Kolkata, March, 2008.

Naik, V.N. (1998) Flora of Maharashtra. Vol.I-II. Amrut Prakashan, Augrangabad (M.S.) India.

Novak, F.A. (1966) The Pictorial Encyclopedia of Plants and Flowers (Ed. Barton, J.G.). Paul Hamlyn, London, Great Britain.

Panda, S. and A. P. Das (2004). Flora of Sambalpur (Orissa). Bishen Singh Mahendra Pal Singh, Dehradun, India.

Panda, T., Mishra, R., Pradhan, B.K. and R.B. Mohanty (2018) Expansive alien flora of Odisha, India. Journal of Agriculture and Environment for International Development 112(1):43-64.

Patil, D.A. (1990) Exotic elements in the flora of Dhule district (Maharashtra). J.Econ.Tax.Bot. 14(3):721-724.

Patil, D.A. (1995) Exotic elements in the flora of Dhule district (Maharashtra)-II. Biojournal 7(1-2):1-8.

Patil, D.A. (2003) Flora of Dhule and Nandurbar District (Maharashtra). Bishen Singh Mahendra Pal Singh, Dehradun, India.

Patil, D.A. (2017a) Alien plant species recorded in Vedic and Post-Vedic period of India, An assessment. Sch.Acad.J.Biosci. 5(17):812-819.

Patil, D.A. (2017b) Invasive alien species in Khandesh region (Maharashtra, India): Diversity, implications and measures. Sch.Acad.J.Biosci. 5(12):867-876.

Patil, D.A. (2019a) Amarsimha's Amarkosa in the perspective of plant invasion in India and implications. International Journal of Agricultural Inventions 4(2):163-169.

Patil, D.A. (2019b) Food Crops: Evolution, Diversity and Advances, Scientific Publishers, Jodhpur, India.

Patil, D.A. (2019c) Scientific history of some alien plants in India: Origin, implications and culture. Plantae Scientia 1(5):66-75.

Patil, D.A. (2020). Unfolding of Yog Chintamani in the perspective of plant invasion in India. Plantae Scientia, 3(04):48-55.

Patil, D.A. (2021a) An Investigation on Linga Purana in perspective plant invasion in India and plant science. International Journal of Agricultural Invention 6(1): 35-39.

Patil, D.A. (2021b) Origins of alien species and plant invasion in India as tapped from Kurma Purana. Vol.4(3):137-142.

Patil, D.A. (2021c) Pali Tipitaka in the perspective of plant invasion in India. Plantae Scientia Vol.4(4&5) 243-249.

Patil, D.A. (2021d) Panini's Astadhyayi in the eyes of plant invasion on Indian Subcontinent. Plantae Scientia 4(4&5) 236-242.

Patil, D.A. (2021e) Plant invasion and vernacularisation of their names in Maharashtra (India). International Journal of Botany Studies 6(4):152-156.

Patil, D.A. (2021f) The epic Mahabharata: Socioculture and plant invasion in Indian subcontinent. International Journal of Botany Studies. 6(5):436-438.

Patil, D.A. (2021g) Hortus Indicus: An enquiry into alien plants-II. Plantae Scientia 4(3):159-163.

Patil, D.A. and D.A. Dhale (2013) Spices and Condiments: Origin, History and Applications. Daya Publishing House, New Delhi, India.

Prakash, S. (1980) Cruciferous oilseeds in India. In: Brassica Crops and Wild Allies (Ed. Tsunodo *et al.*). Japan Scientific Press, Tokyo, Japan.

Pullaiah, T. and D. Muralidhara Rao (2001) Flora of Eastern Ghats Vol.1. Hill Ranges of South East India. Regency Publications, New Delhi, India.

Purseglove, J.W. (1968) Tropical Crops-Dicotyledons. 2 Vols. Longmans, London, UK.

Rajagopal T, Panigrahi G (1965). 'Aliens' naturalized in the flora of Allahabad. Proc.Nat.Acad.Sci.India. Sect.B. 35(4):411-422.

Reddy, C. Sudhakar (2008) Catalogue of Invasive Alien Flora of India. Forestry And Ecology Division, National Remote Sensing Agency, Balanagar, Hyderabad-500037, India.

Ridley, H.N. (1930) The Dispersal of Plants Throughout the World. L.Reeve & Co. Ltd., Ashford, Kent, England.

Roxburgh, W. (1814) Hortus Bengalensis (A Catalogue of The Plants in The Honourable East India Company Botanic Garden, Calcutta) Serampore, India.

Sainkhedia, J. (2016). Invasive alien flora of Harda district of Madhya Pradesh. Indian Journal of Applied Research 6(4):343-346.

Sawant, B.S., Alawe, J.R. and K.V. Rasal (2016) Pharmacognostic study of Glycyrrhiza glabra Linn.: A review. International Ayurvedic Medical Journal 4(10):3989-3993.

Shah, N.C. (2014) Allium sativum (Garlic): The folk and modern uses: Part-I. The Scitech Journal 1(5):31-36.

Shetty, B.V. and V. Singh (1987) Flora of Rajasthan. Vol.I. Bot.Surv.India, Calcutta, India.

Singh Th. B., Das, A.K. and P.K. Singh (2015). Study of alien and invasive flora of Valley District of Manipur and their control. International Journal for Innovative Research In Science & Technology 1(12):2349-6010.

Singh, A.K. and S.N. Nigam (2017) Ancient alien crop introductions integral to Indian agriculture. An overview. Proc.Indian Natn.Sci.Acad. 83(3):549-568.

Singh, N.P., Karthikeyan S.; Lakshminarsimhan P. and P.V.Prasanna (2000) Flora of Maharashtra State: Dicotyledons Vol.I. Bot.Surv.India, Calcutta, India.

Singh, N.P., Lakshminarasimhan P., Karthikeyan S. and P.V. Prasanna (2001). Flora of Maharashtra State: Dicotyledones. Vol.II. Bot.Surv.India, Calcutta, India.

Singh, S.C. and G.N. Srivastava (2000) Exotic medicinal plants of Lucknow district (U.P.) India. In: Ethnobotany And Medicinal Plants of Indian Subcontinent (Ed. Maheshwari, J.K.) Scientific Publishers, Jodhpur, India. pp.223-235.

Singh, V., Parmar, J. and P.R. Pandey (1991) Flora of Rajasthan. Vol.II. Bot.Surv.India, Calcutta, India.

Spect, C.E. and A. Diederichsen (2001) Brassica. In: Mansfeld's Encyclopedia of Agricultural and Horticultural Crops. 1 to 6 Vols. (Ed. Hanelt, P.) Springer-Verleg, Berlin, Germany.

Srivastava S., Dvivedi A. & Shukla R.P. (2014) Invasive alien species of terrestrial vegetation of North-Eastern Uttar Pradesh. International Journal of Forestry Research. Article ID959875 pp.1-9.

Stewart, R.R. (1972) An Annonated Catalogue of The Vascular Plants of West Pakistan and Kashmir. Fakhri Press, Karachi, Pakistan.

Struwig, M. and S.J. Siebert (2013) A taxonomic revision of Boerhavia (Nyctaginaceae) in southern Africa. South Africa Journal of Botany 86:116-134.

Thakur, R.K. and K. Ambrish (2023) Floristic diversity of invasive weeds in Shirpur taluka of Dhule district, Maharashtra State, India. International Journal of Advanced Research in Science, Communication and Technology 3(2):445-453.

Veerasamy, A. and R. Arumugan (2014) Diversity of invasive alien species in Boluvampatti Forest Range. Southern Western Ghats, India. Biodiversity Journal 5(3):377-386.

Voight J.O. (1845) Hortus Suburbans Calcuttensis, Bishop's College Press, Calcutta, India.

Wagh, V.V. and A.K. Jain (2018) Status of ethnobotanical invasive plants in Western Madhya Pradesh, India. South African Journal of Botany 114:171-180.

Watt, G. (1908) A Dictionary of Economic Products: The Commercial Plants of India. John Murray, London, UK.

Yadav, S.R. and M.M.Sardesai (2002) Flora of Kolhapur District (Maharashtra). Shivaji University, Kolhapur, Maharashtra, India.

Table-I: Exotic Plant Species in Bhela Samhita

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/Wild(W) (4)	Habit (5)	Nativity & Reference (6)
1.	Karaja, Bhringaraja	*Eclipta alba* (L.) Hassk. (Syn.E.prostrata L.) Asteraceae	W	Herb	South & Tropical America: Patil, 1990; Reddy, 2008.
2.	Krushvrihi	*Digera muricata* (L.) Mart. Amaranthaceae	W	Herb	(i) South-West Asia: Reddy, 2008; Chandra Sekar, 2012. (ii) Afro-Asian: Naik, 1998; Patil, 2003 (iii) Probably North Africa: Rajagopal & Panigrahi, 2015.
3.	Kshavaka	*Lens culinaris* Medik. Papilionaceae	C	Herb	(i) Central Europe: Mediterranean Region & West Asia: Patil, 1995. (ii) Mediterranean Region & West Asia: Shetty & Singh, 1987.
4.	Gavadani	*Citrulus colocynthis* (L.) Schrad. Cucurbitaceae	W	Climber	West Africa: Sainkhediya, 2016; Patil, 2021d.
5.	Atibala	*Abutilon indicum* (L.) Sweet Malvaceae	W	Shrub	Africa: Thakur & Ambrish, 2023.
6.	Avakpuspi, Apamarga, Kharapuspo	*Achyranthes aspera* L. Amaranthaceae	W	Herb	(i) Tropics: Patil, 2021b,d. (ii) South-East Africa: Singh *et al.*, 2015.
7.	Vacha	*Acorus calamus* L. Araceae	C	Herb	(i) Southern Asia, Central & West-North America: Novak, 1966. (ii) Europe: Almeida, 2009b.
8.	Shirisha	*Albizia lebbeck* (L.) Benth. Mimosaceae	C	Tree	(i) Pantropical Africa & Tropical Asia: Bhandari, 1978. (ii) North Australia & Tropical Asia: Patil, 2017a.
9.	Palandu	*Allium cepa* L. Liliaceae	C	Herb	(i) West Asia: Naik, 1998; Patil, 2003. (ii) Persia: Bailey, 1928. (iii) Western Temperate Asia: De Candolle, 1959. (iv) West Indies: Almeida, 2009a. (v) Central Asia: Shah, 2014.
10.	Lasunam	*Allium sativum* L. Liliaceae	C	Herb	(i) Europe: Naik, 1998; Patil, 2003; Bailey, 1949. (ii) Central Asia: Shah, 2014.
11.	Kumari	*Aloe vera* (L.) Burm.f. (Syn.A.barbadensis Mill.) Liliaceae	C	Herb	(i) North America: Patil, 2003; Naik, 1958. (ii) America: Yadav & Sardesai, 2002. (iii) Mediteranean Region: Bailey, 1949.
12.	Satapuspa	*Anethum graveolens* L. Apiaceae	C	Herb	Europe: Patil, 2003; Yadav & Sardesai, 2004; Stewart, 1972.
13.	Ajamoda	*Apium graveolens* L. Apiaceae	C	Herb	Europe: Debnath & Debnath, 2017; John, 1891.
14.	Swarnkshiri, Hemadugdha	*Aregmone mexicana* L. Papaveraceae	W	Herb	(i) Tropical America: Shetty & Singh, 1987. (ii) South America: Chandra Sekar, 2012. (iii) Mexico: Lesley, 2020.
15.	Sahachara, Sitapaki	*Barleria prionitis* L. Acanthaceae	C	Shrub	Tropical Africa: Medakkar & Sharma, 2016a; Patil, 2021g.
16.	Nichula	*Barringtonia acutangua* Gaertn. Barringtoniaceae	W	Tree	Tropical America: Kalita *et al.*, 2019.
17.	Upodika, Upokoda	*Basella alba* L. Basellaceae	C	Climber	Tropical Asia & Africa: Singh *et al.*, 2015
18.	Kushmandalam	*Benincasa hispida* (Thunb.) Cogn. Cucurbitaceae	C	Climber	(i) Java: Patil, 1995, 2003. (ii) Japan & Java: De Candolle, 1959.
19.	Samanga	*Mimosa pudica* L. Mimosacee	C	Shrub	(i) South America: Ridley, 1930. (ii) Brazil: Patil, 2017b; Shetty & Singh, 1987. (iii) Tropical America: Almeida, 1998.
20.	Punarnava, Kathilakka, Kathilla	*Boerhiva repens* var. *diffusa* (L.) Hook. f. Nyctaginaceae	W	Herb	(i) South Africa: Struwig & Siebert, 2013. (ii) Tropical Africa; Panda *et al.*, 2018; Patil, 2021d.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/Wild(W) (4)	Habit (5)	Nativity & Reference (6)
	Shalmadi				
21.	Shalmali	*Bombax ceiba* L. (Syn. Salmalia malabarica Schott & Endl.) Bombacaceae	W	Tree	(i) America & Australia: Mukhopadhyay & Chakraverty, 2008. (ii) Brazil To Argentina: Sinth *et al.*, 2015. (iii) Africa: Gaikwad & Garad, 2015.
22.	Talaphalam	*Borassus fabillifer* L. Arecaceae	C	Tree	Tropical Africa: Reddy, 2008; Chandra Sekar, 2012; Cooke, 1958.
23.	Sarsapah	*Brassica campestris* L. Brassicaceae	C	Herb	Mediterranean Region: Almeida, 1996.
24.	Rajasarsapah, Sukshma, Sarspa	*Brassica juncea* L. Brassicaceae	C	Herb	(i) Middle East & Neighbouring Region: Prakash, 1980. (ii) Eastern Europe & China: Spect & Diedarichsen. 2001. (iii) Tibet: Medakkar & Sharma, 2016b.
25.	Adhaki	*Cajanus cajan* (L.) Mill. Papilionaceae	C	Shrub	Tropical Africa: De Candolle, 1959; Gaikwad & Garad, 2015.
26.	Arka	*Calotropis procera* (Ait.) R.Br. Asclepiadaceae	W	Shrub	(i) Tropical Africa: Reddy, 2008; Chandra Sekar, 2012. (ii) Persia & Africa: Almeida, 2001a.
27.	Sidhhi	*Cannabis sativa* L. Cannabinaceae	W	Herb	(i) Central Asia: Chandra Sekar, 2012. (ii) Caspian Sea Region & Caucasus Mountain: Watt, 1908; Patil, 2019a.
28.	Karamarda	*Carissa carandas* L. Apocynaceae	W	Shrub	(i) South Africa: Sainkhedia, 2016. (ii) Malayasia: Medakkar & Sharma: 2016b.
29.	Karavi	*Carum carvi* L. Apiaceae	C	Herb	Western Asia,. Europe & North America: Patil, 2020; Patil & Dhale, 2013.
30.	Karnikara, Aragwadha, Chaturangula	*Cassia fistula* L. Caesalpiniaceae	C	Tree	(i) North America: Debnath & Debnath, 2017. (ii) Tropical Asia: Mukhopadhyay & Chakraverty, 2008. (iii) West Indies: Singh *et al.*, 2015.
31.	Vastuka	*Chenopodium album* L. Chenopodiaceae	W	Herb	Europe: Kaul, 1986; Chandra Sekar, 2012.
32.	Chanaka	*Cicer arientinum* L Papilionaceae	C	Herb	(i) Mediterranean Region: Shetty & Singh, 1987. (ii) South Europe: Patil, 1990.
33.	Karpura	*Cinnamomum camphora* L. Lauraceae	C	Tree	(i) China & Japan: Bailey, 1949. (ii) Japan: Matthew, 1991. (iii) South-East Asia: Novak, 1996. (iv) Taiwan: Gopalswamiengar, 1991. (v) China, Japan & Taiwan: Lesley, 2020.
34.	Tvak	*Cinnamomum verum* J.S.Presl. (Syn.C.zelanicum Breyn.) Lauraceae	C	Tree	(i) Ceilone (Sri Lanka): John, 1891; Singh *et al.*, 2015. (ii) South-East Asia: Novak, 1966.
35.	Patha, Ekasthila	*Cissampelos pareira* L. Menispermaceae	W	Climber	South America: Rajagopal & Panigrahi, 1965; Panda *et al.*, 2018; Patil, 2021c.
36.	Bijapura, Matulunga	*Citrus medica* L. Rutaceae	C	Tree	China: Roxburgh, 1814; Patil, 2019a.
37.	Shweta	*Clitoria ternatea* L. Papilionaceae	W	Climber	Tropical America: Purseglove, 1968.
38.	Bimbi	*Coccinia grandis* (L.) Voight Cucurbitaceae	W,C	Climber	Africa: Medakkar & Sharma 2016b.
39.	Pindalu	*Colocasia esculenta* L. Araceae	C	Herb	(i) Brazil: Graf, 1980. (ii) Greece, Asia Minor, Syria, Brazil & Jamaica: Almeida, 2009b. (iii) Probably Tropical Asia: Lesley, 2020.
40.	Dhanyaka	*Coriandrum sativum* L. Apiaceae	C	Herb	(i) South Europe: Gaikwad & Garad, 2015; Yadav & Sardesai, 2002. (ii) Mediterranean Region: Shetty & Singh, 1987.
41.	Jirakam	*Cuminum cyminum* L.	C	Herb	(i) South Europe: Yadav & Sardesai, 2002.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/Wild(W) (4)	Habit (5)	Nativity & Reference (6)
		Apiaceae			(ii) Mediterranean Region: Patil, 1995; Shetty & Singh, 1987.
42.	Rohisha	*Cymbopogon martini* (Roxb.) Wats. Poaceae	W	Herb	(i) Afro-Asian: Naik, 1998. (ii) Africa: Yadav & Sardesai, 2002.
43.	Golomi	*Cynodon dactylon* Pers. Poaceae	W	Herb	Tropical Africa: Debnath & Debnath, 2017; Wagh & Jain, 2015; Srivastava *et al.*, 2014.
44.	Musta, Bhadramusta	*Cyperus rotundus* L. Cyperaceae	W	Herb	(i) Tropical Africa: Debnath & Debnath, 2017. (ii) Europe: Kaul, 1986.
45.	Kalattha, Kaulattha	*Macrotyloma uniflorum* (Lam.) Verdc. Papilionaceae	C	Herb	South-East Asia: Patil, 2019b.
46.	Nispava	*Lalab purpureus* (L.) Sweet. (Syn. Dolichos lablab L.) Papilionaceae	C	Climber	(i) Tropical Africa: Debnath & Debnath, 2017. (ii) Africa: Hewson & Thompson, 1993.
47.	Garedhuka	*Coix lachryma-jobi* L. Poaceae	W	Herb	Tropical Asia: Singh *et al.*, 2015; Patil, 2021d.
48.	Paribhadra	*Erythrina variegata* L. Erythrina indica Lam. Papilionceae	C	Tree	Malaysia: Medakkar & Sharma, 2016c.
49.	Snuhi, Sudha	*Euphorbia ligularia* Roxb. (Syn.E.neriifolia L.) Euphorbiaceae	W	Shrub	Africa: Naik, 1998.
50.	Yastimadhu, Madhuka	*Glycerrza glabra* L. Papilionaceae	C	Herb	Arabia, Persian Gulf, Afghanistan, Turkestan, Asia Minor & Siberia: Sawant *et al.*, 2016; Patil, 2019a.
51.	Karpasa	*Gossypium herbaceum* L. Malvaceae	C	Herb	(i) Arabia & Asia Minor: Bailey, 1949. (ii) Africa & Asia (Excl. India): Purseglove, 1968.
52.	Ambastha, Ambasthki	*Hibiscus sabdariffa* L. Malvaceae	C	Herb	(i) Africa & Asia (Excl. India): Patil, 1995; Purseglove, 1968. (ii) America: Backer & Brink, 1963. (iii) West Africa: Purseglove, 1968.
53.	Yavaka	*Hordeum vulgare* L. Poaceae	C	Herb	Europe & North America: Dar *et al.*, 2002.
54.	Laksha	*Kerria japonica* (L.) DC. Rosaceae	C	Shrub	(i) China & Japan: Graf, 1980. (ii) China: Novak.
55.	Ikshwaku, Alabuh, Lavukah	*Lagenaria siceraria* (Molina) Standl Cucurbitaceae	C	Shrub	Africa: Singh & Nigam, 2017; Patil, 2019c.
56.	Kalayaka	*Lathyrus sativus* L. Papilionaceae	C	Herb	(i) Balkan Peninsula: Kislev, 1989. (ii) Southern Europe & Western Asia: Helback, 1965. (iii) South-West Asia & Southern Balkan: Castillow *et al.*, 2016.
57.	Madayantika	*Lawsonia inermis* L. Lythraceae	C	Shrub	(i) Middle East: Gaikwad & Garad, 2015. (iii) Arabia & Persia: Shetty & Sinigh, 1987. (iii) Arabian Countries: Chaphekar *et al.*, 2007. (iv) Northern Africa: Patil, 2019c.
58.	Kshauma	*Linum usitatissimum* L. Liliaceae	C	Herb	(i) Mediterranean Region: De Candolle, 1959; Patil, 2019c. (ii) Europe: Dar *et al.*, 2002.
59.	Koshataki Rajakosha-takam	*Luffa acutangula* (L.) Roxb. Cucurbitaceae	C	Climber	Tropical Asia: John, 1891.
60.	Dhamargava	*Luffa cylindrica* (L.) M.J. Roem. Cucurbitaceae	C	Climber	Egypt: John, 1891.
61.	Mahanimba	*Melia azedarach* L. Meliaceae	C	Tree	(i) Myanmar: Patil, 2003. (ii) Burma: Kshirsagar & Patil, 2008.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/Wild(W) (4)	Habit (5)	Nativity & Reference (6)
62.	Shigru, Sbhajanak	*Moringa oleifera* L. Moringaceae	C	Tree	America: Singh & Srivastava, 2000.
63.	Kapikachhu, Atmagupta	*Mucuna prurens* (L.) DC. Papilionaceae	W	Climber	America: Singh & Nigam, 2017.
64.	Kiadarya	*Murraya koenigii* (L.) Spreng. Rutaceae	C	Tree	Tropical Africa: Martin *et al.*, 1987.
65.	Jativvkasham	*Myristica fragrans* Houtt. Myristiceae	C	Tree	Moluccas: Singh *et al.*, 2001.
66.	Karavira	*Nerium indicum* Mill. Apocynaceae	C	Shrub	(i) China, Cochin China: Voight, 1845. (ii) China, Almeida, 2001a. (iii) Mediterranean Region; Purseglove, 1968. (iv) Persia & Japan; Matthew, 1991.
67.	Ajaji, Prithvika, Kunchika	*Nigella sativa* L. Ranunculaceae	W,C	Herb	(i) Eastern Mediterranean Region: Deb, 2021e. (ii) Europe: Bailey, 1949; Khurro *et al.*, 2007.
68.	Karbudara	*Bauhina variegat* L. Caesalpiniaceae	C	Tree	China: Debnath & Debnath, 2017; Patil, 2021d.
69.	Changeri	*Oxalis corniculata* L. Oxalidaceae	W	Herb	(i) Europe: Reddy, 2008; Chandra Sekar, 2012. (ii) North America: Bailey, 1949; Babu, 1977. (iii) Asia (Excl. India) & Europe: Kaul, 1986.
70.	Kodravam, Koradus, Uddalaka	*Paspalum scrobiculataum* L. Poaceae	W	Herb	Topical Africa: Singh & Nigam, 2017.
71.	Chitraka, Vyala	*Plumbago zeylanica* L. Plumbaginaceae	W	Shrub	(i) Africa: Rajagopal & Panigrahi, 1965. (ii) Tropics & Subtropics: Matthew, 1991.
72.	Dadima	*Punica granatum* L. Punicaceae	C	Tree	(i) South Asia: Gaikwad & Garad, 2015. (ii) Afghanistan, Baluchistan & Persia: Patil, 2003; De Candolle, 1959; Shetty & Singh, 1987.
73.	Mulakam	*Raphanus sativus* L. Brassicaceae	C	Herb	(i) Western Asia: Purseglove, 1968. (ii) China, Japan & West Asia: Voight, 1845. (iii) Europe & Temperate Region: Patil, 1995. (iv) Europe: John, 1891.
74.	Eranda Gandarva-hasta	*Ricinus communis* L. Euphorbiacee	C	Tree	(i) Tropical Africa: Yadav & Sardesai, 2002; Lesley, 2020. (ii) Africa: Patil, 2017a, Purseglove, 1968.
75.	Kasa	*Saccharum spontaneum* L. Poaceae	W	Herb	Tropical West Asia: Reddy, 2008; Chandra Sekar, 2012.
76.	Ingudi	*Balanites aegyptica* (L.) Del. Balanitaceae	W	Tree	Africa & Arab: Medakkar & Sharma, 2016d
77.	Bhallataka	*Semercarpus anacardium* L. Ancardiacee	C	Tree	West Indies: Sainkhedia, 2016.
78.	Tila	*Sesamum orientale* L. (Syn.S.indicum L.) Pedaliaceae)	C	Herb	Africa: Dogra, 2011.
79.	Syamaka, Prasadik, Kangu	*Setaria indica* Beauv. Poaceae	C	Herb	(i) North East (China): Singh & Nigam, 2017. (ii) East Asia: Naik, 1998. (iii) Northern China: Castillow *et al.*, 2016.
80.	Bala	*Sida cordifolia* L. Malvaceae	W	Herb	Tropics & Subtropics of Both Hemispheres: Bhandari, 1978; Patil, 2019a.
81.	Siddharthaka, Goura-sarshapa	*Sinapis alba* L. Brassicaceae	C	Herb	(i) Africa & Europe: Stewart, 1972. (ii) Mediterranean & Macronesian Region: Almeida, 1996. (iii) Eurasia: Bailey, 1949. (iv) Mediterranean Region: Novak, 1966.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/Wild(W) (4)	Habit (5)	Nativity & Reference (6)
82.	Kakamachi	*Solanum nigrum* L. Solanaceae	W	Herb	(i) Tropical America: Debnath & Debnath, 2017: Chandra Sekar, 2012. (ii) Europe & America: Almeixa, 2001b.
83.	Brihati	*Solanum anguivi* Lam. (Syn.S.indicum auct non L.) Solanaceae	W	Herb	Africa: Pullaiah & Rao, 2001.
84.	Vartaka	*Solanum melongena* L. Solanaceae	C	Shrub	(i) East Indies: Singh *et al.*, 2001. (ii) America: Gaikwad & Garad, 2015.
85.	Kankakarika	*Solanum virginianum* (Syn.S.anthocarpum Schrad & Wendl.) Solanaceae	W	Herb	Paleotropical: Singh & Srivastava, 2000.
86.	Amrataka	*Spondias pinnata* (L.f.) Kurz. Anacardiaceae	C	Tree	Tropical Asia: Martin *et al.*, 1987.
87.	Nandi	*Tabennaemontana divaricata* (L.) R. Br. Ex Roem. & Schult. Apocynaceae	C	Tree	(i) Tropical Asia: Singh *et al.*, 1991. (ii) South-East Asia: Almeida, 2001a.
88.	Ajamoda	*Trachyspermum ammi* (Linn.) Sprague Apiaceae	C	Herb	(i) South Europe: Yadav & Sardesai, 2002. (ii) Africa: Patil, 1995; Shetty & Singh, 1987.
89.	Amlika	*Tamarindus indica* (L.) Caesalpiniaceae	C	Herb	(i) Tropical America: Patil, 1990; Shetty & Singh, 1987. (ii) Probably Africa: Panda & Das, 2004. (iii) Abyssinia In Central Africa; Chaphekar *et al.*, 2007.
90.	Ajagandha	*Thymus serpyllum* L. Lamiaceae	C	Shrub	Europe: Yadav & Sardesai, 2002; Singh, *et al.*, 1991; Gaikwad & Garad, 2015.
91.	Goksukara, Swdukantaka	*Tribulus terrestris* L. Zygophyllaceae	W	Herb	(i) Tropical America: Reddy, 2008; Chandra Sekar, 2012. (ii) Africa & Asia (Excl. India): Kaul, 1986.
92.	Godhuma	*Triticum aestivum* L. Poaceae	C	Herb	Fertile Crescent: Sign & Nigam, 2017; Patil, 2017a.
93.	Sahadeva	*Vernonia cinera* (L.) Less. Asteraceae	W	Herb	South America: Debnath & Debnath, 2017.
94.	Virana, ushiram	*Vetiveria zizanoides* (L.) Nash. Poaceae	C	Herb	China: Medakkar & Sharma 2016c.
95.	Harenu	*Vitx negundo* L. Verbenaceae	W	Shrub	North China & Mongolia: Bailey, 1949.
96.	Mrudvika, Draksha	*Vitis vinifera* L. Vitaceae	C	Climber	(i) South-East Europe To West Indies: Singh *et al.*, 2000a; Patil, 2019c. (ii) West Indies: Gaikwad & Garad, 2015.
97.	Badara, Badaram	*Ziziphus mauritiana* Lam. Rhamnaceae	C	Tree	(i) Tropics & Warm Tropics: Martin *et al.*, 1987. (ii) Australia: Veerasamy & Arumugan, 2014.
98.	Badari	*Ziziphus mauritiana* Lam. Rhamnaceae	C	Tree	(i) Tropics & Warm Subtropics: Martin *et al.*, 1987. (ii) Australia: Veerasamy & Arumugan, 2014.