



REVIEW ARTICLE

Gleanings from Brhat Sumhita in Context of Plant Invasion in India

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ABSTRACT

This communication informs exotic plant species as gleaned from Varahamihira's (505-587 AD) Brhat Samhita. The said treatise contains plant species of medicinal significance and also those used for miscellaneous purposes. The present author critically analysed their Sanskrit plant names and equated with recent botanical (Latin) names assigning to their respective families. They are deciphered for their exotic status consulting relevant taxonomic literature. Brhat Samhita contains information on total 273 plant species for various uses. Out of these, as many as 77 exotic plant species pertaining to 73 genera and 38 angiospermic families. Their categorization based on habit is also proposed along with their status regarding wildness or as cultigens. It is hoped that such studies on plant invasion in ancient period of India many helps add in the history of bioinvasion and also useful in the considerations of biodiversity management and its conservation measures in future.

Keywords: Brhat Samhita, Exotic Plants, Bioinvasion, India.

INTRODUCTION

Bharat Samhita by Varaha Mihira (6th Century AD.) is a historical treatise. It reflects glimpses of social and cultural practices of the said period. The plants are an essential component of the Mother Nature and is also a mainstay of human life. These plant taxa are mentioned for some useful plant products, medicinal ones and miscellaneous utilities in the said treatise. The Sanskrit plant names are tapped from it and equated with the valid Latin names using relevant taxonomic literature, apart from their exotic status and region of origin.

METHODOLOGY

The scripture viz., Bhrahm Samhita by Varah Mihira edited by Ramakrishna (1982) was critically studied for biodiversity elements. The Sanskrit plant names are equated with the recent botanical (Latin) names and also assigned to their respective families. Their exotic status is deciphered consulting relevant taxonomic literature as mentioned against each species in the Table-I. The information w.r.t. habit and their status (wild or cultivated) is also provided. The data so obtained is discussed in the light of plant invasion in ancient period of India.

RESULTS & DISCUSSION

The plant kingdom, being an important part of the Mother Nature, has drawn attention of the mankind working in different fields of enquiry. Various floral elements are integrated in ancient scriptures or treatises. The Sanskrit is although not used as a medium of communication, it is but rich in content embedded in ancient Indian literary sources. Brhat Samhita is one such classical treatise worth to be studied from the biodiversity point of view in Indian landmass. The present attempt dealt with particular emphasis on plant invasion (bioinvasion) in India in the ancient past. This attempt is also aimed at adding botanical annals limelighting exotic plant taxa mentioned in the said Samhita.

The floristic analysis of the biodiversity contained in the Brhat Samhita brought to light certain facts. Total 273 species are described for various uses, inclusive of medicinal ones. Of these, a total of 77 exotic plant species pertaining to 73 genera and 38 angiospermic families are divulged from the said Samhita. The dicotyledons are represented by 64 species belonging to 61 genera and 33 families, whereas the monocotyledons do so by 14 species pertaining to 12 genera and 05 families. Obviously, the dicotyledons have a dominant role in bioinvasion in the then India in comparison to the monocotyledons. These taxa are trees (25 species), shrubs (09 species), climbers (09 species) and herbs (40 species). Thus, the herbaceous floral elements played relatively a greater role in bioinvasion. These taxa are either cultivated (51 species),

wild (24 species) or belong to both status wild and cultigens (03 species). The cultivated ones are brought in Indian subcontinent intentionally especially for medicare. The wild ones, however, invaded naturally or negligently during various human migration and activities. Invasion by alien plant species is being recorded particularly after Indian independence (cf. Maheshwari, 1962, 1979; Nayar, 1977). Although these attempts indicated changing patterns of Indian biodiversity, no serious in-depth investigations are extended. Of late, floristic studies and publications on national, regional, state and district floras took notice of the exotic plant species. However, they paid cursory attention. Some researchers published accounts covering exotic plants exclusively which brought to a forefront the substantial status of plant invasion. However, these publications are scattered. Recently, the present author compiled a state level exotic flora of Maharashtra (Patil, 2024) and also at national level (Patil, 2021d). The present author still thought worthwhile to extend investigation in ancient period. To suffice this need, the screening of flora elements mentioned in the Sanskrit treatise viz., Brhat Samhita is completed. These results may add in the history of bioinvasion in Indian landmass and aid in biodiversity management and its conservation.

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Table-I: Exotic Plant Species in Brhat Samhita

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
1.	Ajamoda	<i>Trachyspermum ammi</i> (Linn.) Sprague Apiaceae	C	Herb	(i) South Europe: Yadav & Sardesai, 2002. (ii) Africa: Patil, 1995; Shetty & Singh, 1987.
2.	Atasi	<i>Linum usitatissimum</i> Linn. Linaceae	C	Herb	(i) Mediterranean Region: De Candolle, 1959; Patil, 2019c. (ii) Europe: Dar <i>et al.</i> , 2002.
3.	Alibala	<i>Abutilon indicum</i> (Linn.) Sw. Malvaceae	W	Shrub	Africa: Thakur & Ambrish, 2023
4.	Aparajita	<i>Clitoria ternatea</i> Linn. Papilionaceae	W	Climber	Tropical America: Purseglove, 1968.
5.	Apamarga	<i>Achyranthes aspera</i> Linn. Amaranthaceae	W	Herb	(i) Tropics: Patil, 2021a,d (ii) South-East Africa: Singh <i>et al.</i> , 2015.
6.	Arka	<i>Calotropis procera</i> (Ait.) R.Br. Asclepiadaceae	W	Shrub	(i) Tropical Asia: Reddy, 2008; Chandra Sekar, 2012. (ii) Persia & Africa: Almeida: 2001a.
7.	Amrataka	<i>Spondias pinnata</i> Kurz. Anacardiaceae	C	Tree	Tropical Asia: Martin <i>et al.</i> , 1987.
8.	Inguda	<i>Balanites aegyptiaca</i> (Linn.) Delile Balanitaceae	W	Tree	Africa & Arab: Medakkar & Sharma, 2016b.
9.	Usira	<i>Vetiveria zizanioides</i> (L.) Nash. Poaceae	C	Herb	China: Medakkar & Sharma, 2016.
10.	Kangu	<i>Setaria italica</i> Beauv. Poaceae	C	Herb	(i) North East (China): Singh & Nigam, 2017. (ii) East Asia: Naik, 1998. (iii) Northern China: Castillo <i>et al.</i> , 2016.
11.	Catambhara	<i>Albizia procera</i> Benth. Mimosaceae	C	Tree	(i) South-East Asia & Australia: Singh <i>et al.</i> , 2015. (ii) Australia: Lesley, 2020.
12.	Katu	<i>Piper cubeba</i> Linn.f. Piperaceae	W	Climber	Borneo, Sumatra, Java & Indonesia: Dandasena <i>et al.</i> , 2023.
13.	Kantakarika	<i>Solanum virginianum</i> L. (Syn. <i>S. xanthocarpum</i> Schrad. & Wendl.) Solanaceae	W	Herb	Paleotropical: Singh & Srivastava, 2000.
14.	Kapikacchu	<i>Mucuna prurens</i> DC. Papilionaceae	W	Climber	America: Singh & Nigam, 2017.
15.	Karavira	<i>Nerium indicum</i> Mill. Apocynaceae	C	Shrub	(i) China, Cochin China: Voight, 1845. (ii) China: Almeida, 2001a. (iii) Mediterranean Region: Deb, 1983. (iv) Europe: Bailey, 1949.
16.	Karpura	<i>Cinnamomum camphora</i> Nees & Eberm. Lauraceae	C	Tree	(i) China & Japan: Bailey, 1949. (ii) Japan: Matthew, 1991. (iii) Taiwan: Gopalswamiengar, 1991.
17.	Kataya	<i>Pisum arvense</i> Linn. Papilionaceae	C	Herb	Italy: Shetty & Singh, 1987.
18.	Karpasa	<i>Gossypium herbaceum</i> Linn. Malvaceae	C	Herb	(i) Arabia & Asia Minor: Bailey, 1949. (ii) Africa & Asia (Excl. India): Purseglove, 1968.
19.	Kasa	<i>Saccharum spontaneum</i> Linn. Poaceae	W	Herb	Tropical West Asia: Reddy, 2008; Chandra Sekar, 2012.
20.	Kasmari	<i>Gmelina arborea</i> Linn. Verbanaceae	C	Tree	Malaya: Medakkar & Sharma: 2016c.
21.	Kurantaka	<i>Barleria prionitis</i> Linn. Acanthaceae	C	Shrub	Tropical America: Medakkar & Sharma, 2016b; Patil, 2021a.
22.	Kasumbha	<i>Carthamus tinctorius</i> Linn. Asteraceae	C	Herb	(i) West Asia: Yadav & Sardesai, 2002. (ii) South-West Asia: Patil, 2003; Cooke, 1958; Gaikwad & Garad, 2018.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
23.	Kodrava	<i>Paspalum scroiculatum</i> Linn. Poaceae	W	Herb	Tropical Africa: Singh & Nigam, 2017.
24.	Goksura	<i>Tribulus terrestris</i> Linn. Zygophyllaceae	W	Herb	(i) Tropical America: Reddy, 2008; Chandra Sekar, 2021. (ii) Africa & Asia (Excl. India): Kaul, 1986.
25.	Godhuma	<i>Triticum aestivum</i> Linn. Poaceae	C	Herb	Fertile Crescent: Singh & Nigam, 2017; Patil, 2017.
26.	Canaka	<i>Cicer arietinum</i> Linn.	C	Herb	(i) Mediterranean Region: Shetty & Singh, 1987. (ii) South Europe: Patil, 1990.
27.	Japa	<i>Hibiscus rosasinensis</i> Linn. Malvaceae	C	Shrub	(i) China: Patil, 1995, 2003. (ii) Sino-Japanese: Singh & Srivastava, 2000.
28.	Jatiphala	<i>Myristica fragrans</i> Houtt. Myristiaceae	C	Tree	Moluccas: Singh <i>et al.</i> , 2001.
29.	Jiraka	<i>Cuminum cyminum</i> Linn. Apiaceae	C	Herb	(i) South Europe: Yadav & Sardesai, 2002. (ii) Mediterranean Region: Patil, 1995; Shetty & Singh, 1987.
30.	Tala	<i>Borassus flabellifer</i> Linn. Arecaceae	C	Tree	Tropical Africa: Reddy, 2008. Chandra Sekar, 2012; Cooke, 1958.
31.	Tintidi	<i>Tamarindus indicus</i> Linn. Caesalpinaceae	W,C	Tree	(i) Tropical America: Patil, 1990; Shetty & Singh, 1987. (ii) Abyssinia In Central Africa: Chaphekar <i>et al.</i> , 2007.
32.	Tila	<i>Sesamum orientale</i> L. (Syn. <i>S.indicum</i> Linn.) Pedaliaceae	C	Herb	Africa: Dogra, 2011.
33.	Triputa	<i>Lathyrus sativus</i> Linn. Papilionaceae	C	Herb	(i) Balkan Peninsula: Kislev, 1989. (ii) Southern Europe & Western Asia: Helback, 1965.
34.	Twak	<i>Cinnamomum verum</i> J.S. Presl. (Syn. <i>C.zeylanica</i> Blume) Lauraceae	C	Tree	(i) Ceylone (Sri Lanka): John, 1891; Singh <i>et al.</i> , 2015. (ii) South-East Asia: Novak, 1966.
35.	Darbha	<i>Imperata cylindrica</i> Beauv. Poaceae	W	Herb	(i) Tropical America: Reddy, 2008; Debnath & Debnath, 2017. (ii) Tropical Asia: Titiek <i>et al.</i> , 2015. (ii) Africa: Almeida, 2009b.
36.	Dadima	<i>Punica granatum</i> Linn. Puniaceae	C	Tree	(i) South Asia: Gaikwad & Garad, 2015. (ii) Afghanistan, Baluchistan & Persia: De Candolle, 1959; Patil, 2003; Shetty & Singh, 1987.
37.	Durva	<i>Cynodon dactylon</i> (Linn.) Pers. Poaceae	W	Herb	Tropical Africa: Debnath & Debnath, 2017; Wagh & Jain, 2015; Srivastva <i>et al.</i> , 2014.
38.	Draksha	<i>Vitis vinifera</i> Linn. Vitaceae	C	Climber	(i) South-East Europe to West Indies: Patil, 2019c. (ii) West Indies: Gaikwad & Garad, 2015.
39.	Dhanyaka	<i>Coriandrum sativum</i> Linn. Apiaceae	C	Herb	(i) South Europe: Gaikwad & Gard, 2015; Yadav & Sardesai, 2002. (ii) Mediterranean Region: Shetty & Singh, 1987.
40.	Dhyama	<i>Cymbopogon citratus</i> (DC.) Stapf. Poaceae	C	Herb	(i) Malaysia & Ceylon (Sri Lanka): Purseglove, 1968. (ii) South-East Asia & Australia: Singh <i>et al.</i> , 2015.
41.	Nala	<i>Phragmites vallatoria</i> (Pluk.) ex. L. Veldk. (Syn. <i>Arundo vallatoria</i> Pluk. ex L.) Poaceae	--	Herb	(i) Africa: Quereshi <i>et al.</i> , 2014. (ii) North America: Garg, 2019.
42.	Nicula	<i>Barringtonia acutangula</i> (Linn.) Gaertn.	W	Tree	Tropical America: Kalita <i>et al.</i> , 2019.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
		Barringtoniaceae			
43.	Nirgudi	<i>Vitex negundo</i> Linn. Verbenaceae	W	Shrub	North China & Mongolia: Bailey, 1949.
44.	Nispava	<i>Lablab purpureus</i> (L.) Sweet (Syn. <i>Dolichos lablab</i> Linn.) Papilionaceae	C	Climber	(i) Tropical Africa: Debnath & Debnath, 2017. (ii) Africa: Hewson & Thompson: 1993.
45.	Patha	<i>Cisampelos pariera</i> Linn. Menispermaceae	W	Climber	South America: Rajagopal & Panigrahi, 1965. Panda <i>et al.</i> , 2018.
46.	Parijata	<i>Erythrina variegata</i> L. (Syn. <i>E. indica</i> Linn.) Papilionaceae	--	Tree	Malaysia: Medakkar & Sharma, 2016c.
47.	Punnaga	<i>Calophyllum inophyllum</i> L. Clusiaceae	W, C	Tree	(i) East Africa: Pullaiah & Rao, 2001. (ii) Tropical Asia: Mukhopadhyay & Chakraverty, 2008.
48.	Puga	<i>Areca catechu</i> Linn. Arecaceae	C	Tree	(i) Tropical Asia: Gaikwaad & Garad, 2015. (ii) Indonesian Archipelago: Ahuja & Ahuja: 2011. (iii) Malaysia & East Indies: Mukhopadhyay & Chakraverty, 2008.
49.	Purnakas	<i>Luffa acutangula</i> Roxb. Cucurbitaceae	C	Climber	Tropical Asia: John, 1891.
50.	Badari	<i>Ziziphus jujuba</i> Mill. Rhamnaceae	C	Tree	China: Sainkhedia, 2016
51.	Bimba	<i>Coccinia grandis</i> (L.) Voight (Syn. <i>C. indica</i> W. & A.) Cucurbitaceae	C	Climber	Africa: Medakkar & Sharma, 2016a.
52.	Bijapura	<i>Citrus medica</i> Linn. Rutaceae	C	Tree	China: Roxburgh, 1814.
53.	Brhati	<i>Solanum anguivi</i> Lam. (Syn. <i>S. indicum</i> Linn.) Solanaceae	W	Herb	Africa: Pullaiah & Rao, 2001.
54.	Bhanga, Vijaya	<i>Cannabis sativa</i> Linn. Cannabinaceae	W	Herb	(i) Central Asia: Chandra Sekar, 2012. (ii) Caspian Sea Region & Caucasus Mountain: Watt, 1908; Patil, 2019c.
55.	Bhallataka	<i>Semecarpus anacardium</i> Linn.f. Anacardiaceae	C	Tree	West Indies: Sainkhedia, 2016.
56.	Manjistha	<i>Rubia cordifolia</i> Linn. Rubiaceae	W	Climber	Asia (Excl. India) & Africa: Kaul, 1986.
57.	Madhu	<i>Glycyrrhiza glabra</i> Linn. Papilionaceae	C	Herb	Arabia, Persian Gulf, Afghanistan, Turkestan, Asia minor & Siberia: Sawant <i>et al.</i> , 2016; Patil, 2019a.
58.	Mallika	<i>Jasminum sambac</i> Ait. Oleaceae	C	Shrub	Tropical Asia: John. 1891; Patil, 2021a.
59.	Masura	<i>Lens culinaris</i> Medic. Papilionaceae	C	Herb	Western Asia: Matny, 2015.
60.	Masaparni	<i>Teramnus labialis</i> Spreng. Papilionaceae	W	Herb	Pantropical: Singh & Srivastava, 2000.
61.	Musta	<i>Cyperus rotundus</i> Linn. Cyperaceae	W	Herb	(i) Tropical Africa: Debnath & Debnath, 2017. (ii) Europe: Kaul, 1986.
62.	Yava	<i>Hordeum vulgare</i> Linn. Poaceae	C	Herb	Europe & North America: Dar <i>et al.</i> , 2002.
63.	Rajakosataka	<i>Luffa cylindrica</i> (Linn.) M. Roem. Cucurbitaceae	C	Climber	Egypt: John, 1891.
64.	Renu	<i>Vitex agnus-castus</i> Linn. Verbenaceae	C	Shrub	Mediterranean To Central Asia: Ahuja & Ahuja, 2015.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
65.	Varahi	<i>Dioscorea bulbifera</i> Linn. Dioscoreaceae	W	Climber	Asia (Excl. India): Stewart, 1972.
66.	Visweswari	<i>Sida cordata</i> (Burn f.) Borss (Syn. <i>S.veronacifolia</i> Lam.) Malvaceae	W	Herb	(i) Asia (Excl. India): Sheikh & Dixit, 2017. (ii) South America: Naqshi <i>et al.</i> , 1988.
67.	Satapuspā	<i>Foeniculum vulgare</i> Mill. Apiaceae	C	Herb	(i) South Europe: Gaikwad & Garad, 2015. (ii) Mediterranean Region: Purseglove, 1968. (iii) Europe: Dar <i>et al.</i> , 2002.
68.	Salmali	<i>Bombax ceiba</i> L. (Syn. <i>Salmalia malabarica</i> Schott & Endl.) Bombacaceae	W	Tree	(i) America & Australia: Mukhopadhyay & Chakraverty, 2008. (ii) Brazil To Argentina: Singh <i>et al.</i> , 2015. (iii) Africa: Gaikwad & Garad, 2015.
69.	Sirisa	<i>Albizia lebbek</i> Benth. Mimosaceae	C	Tree	(i) Pantropical Africa & Tropical Asia: Bhandari, 1978. (ii) North Australia & Tropical Asia: Patil, 2017.
70.	Srngataka	<i>Trapa natans</i> var. <i>bispinosa</i> (Roxb.) Makina (Syn. <i>T.bispinosa</i> Roxb.) Trapaceae	W	Herb	(i) Europe: Kaka, 1990. (ii) Persia To Central Europe: Pullaiah <i>et al.</i> , 2007.
71.	Sahadevi	<i>Vernonia cinerea</i> Less. Asteraceae	W	Herb	South America: Debnath & Debnath, 2017.
72.	Suvarna	<i>Cassia fistula</i> Linn. Caesalpinaceae	C	Tree	(i) North America: Debnath & Debnath, 2017. (ii) Tropical Asia: Mukhopadhyay & Chakraverty, 2008. (iii) West Indies: Singh <i>et al.</i> , 2015.
73.	Somaraji	<i>Vernonia anthelmintica</i> Willd. Asteraceae	W	Herb	Malay Archipelago: Mitra & Mukherjee, 2012.
74.	Kumari	<i>Aloe vera</i> (L.) Burm.f. (Syn. <i>A.barbadensis</i> Mill.) Liliaceae	C	Herb	(i) North America: Patil, 2003; Naik, 1998. (ii) America: Yadav & Sardesai, 2002. (iii) Mediterranean Region: Bailey, 1949.
75.	Kurantaka	<i>Barleria cristata</i> L. Acanthaceae	C	Shrub	Paleotropical: Singh & Srivastava, 2000.
76.	Kustumburu	<i>Coriandrum sativum</i> L. Apiaceae	C	Herb	(i) South Europe: Yadav & Sardesai, 2002; Gaikwad & Garad, 2015. (ii) Mediterranean Region: Shetty & Singh, 1987.
77.	Nandikavarta	<i>Tabernaemontana divaricata</i> (L.) R.Br. ex Roem. & Schult. Apocynaceae	C	Tree	(i) Tropical Asia: Singh <i>et al.</i> , 1991. (ii) South-East Asia: Almeida, 2001a.