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Deductions And Evidences of Plant Invasion In India Through The Gleanings of Raja Nighantu

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Abstract:

Ancient Sanskrit and Ayurvedic lexicons are sources of information about plant world. The plant species in such scriptures are described for some material use by the contemporary societies. These scriptures were initially intertwined with myth and legends but gradually over the long past they turned to be rational. They have not been mostly thought sources of ecological or biological information. The present author extended investigation in the perspective bioinvasion in India. Raja Nighantu contained many plant species. As many as 89 plants have been identified as exotic pertaining to 83 genera and 44 angiospermic families. The dicotyledons played a major role in invading Indian territory (76 species, 74 genera and 39 families). At the same, the monocotyledons shared little comparatively (13 species, 09 genera and 05 families). They belong to both Old and New worlds covering various continents, countries, islands and specific geographical regions. They are either wild (46 species) or cultigens (41 species). Two plants species are found wild as well as under cultivation. The herbaceous plant species, however, played a major role in bioinvasion in India. The data so obtained may be of use while extending measures to manage and conserve Indian biodiversity.

Key Words: Raja Nighantu, Exotic Plants, Bioinvasion, India.

Introduction:

The lexicon *viz.*, Raja Nighantu is authored by Acharya Narahari Pandit (15th century AD). The name 'Raja', according to him, conveys this Nighantu as best among all earlier Nighantus. This lexicon is also called 'Abhidanachudamani' and placed between 14th to 15th century AD. Interestingly, he specifies seven bases for coining a plant name established by 'rudhi' (based on traditional use), prabhava (based on effect), deshyokti (based on habitat), lanchana (based on the signs and symbols), upama (based on the simile), veerya (based on the potency) and itarahva (miscellaneous). It is divided into 24 sections. The basis 'brabhava' refers to the pharmacological action of the plant. The rationale of naming a plant is well

documented in this lexicon. These names help in understanding different aspects of the plant or plant science.

Methodology:

The literary source to obtain Sanskrit plant names is those of Tripathi (2010). These names have been equated with the valid botanical names (Latin binomials). They are assigned to their respective plant family. The data *w.r.t.* habit and status (wild or cultivated) is recorded in the Table-I. Nativity (exotic status) is deciphered consulting relevant taxonomic literary sources. These sources are mentioned against each plant species in the same table. The information gathered is used to interpret plant invasion in the erstwhile India.

Results & Discussion:

Genesis and development of Indian system of medicine, the Ayurveda, was initiated since Vedic period and went through Samhita and Nighantu period. The identities of Materia Medica become a challenge and over a period of long time in every lexicon, whether some Samhita or Nighantu, an attempt has been to solve controversies, to render correct description and nomenclature. Raja Nighantu is a step forward in this direction. These Materia Medica are named in Sanskrit signifying an attribute of the substances like morphology, place of origin, major therapeutic applications. Although so, the plant species have not been usually considered from the ecological or biological point of view. The present author endeavoured to think about plant invasion in India based on the species contained in such lexicon.

The Raja Nighantu is authored during 15th century AD. Its author himself regarded this lexicon as the best one among all either lexicons. This is indicated by its name Raja. The author Acharya Narhari Pandit mentioned 300 synonyms of total 170 plant species. The present author while scrutinizing their exotic status could record a total of 89 species pertaining to both Old and New Worlds. These belong to 83 genera and 44 families of angiosperms. The dicotyledonous taxa among these have major share in bioinvasion in India (76 species, 74 genera and 39 families). The monocotyledonous taxa have comparatively lesser share (13 species, 09 genera and 05 families). It is to be noted that these bioresources are wild (46 species), cultigens (41 species) or both wild as well as cultivated (02 species). Although, the author of this lexicon indicated their medicinal utilities, they are also beneficial in other compartments of human life in India. They are also useful as: vegetable, spices and condiments, edible fruits, oil-yielding, cereals, aromatics, narcotics, pulses, fibre-yielding, masticatory, ornamental, dyes, etc. These bioresources obviously added in Indian economy, apart from human healthcare. The wild species are presently forming an integral part of Indian biodiversity. They can be categorized in different habital groups *viz.*, trees (14 species) and herbaceous ones (56 species). The herbaceous taxa certainly invaded on large scale in Indian landmass. They are useful only seasonally. The woody sources *viz.*, trees and shrubs are perennial and useful throughout the period of a year. The 89 plant species are investigated for their biogeographical *vis-à-vis* nativities after consulting relevant taxonomic literature for each species. They belonged to both Old and New worlds. They represent different continents, countries, islands mountains and certain specific

geographical region of the world. Their numerical representation is thus: America (32), Africa (27), Asia (Excl. India (25), Europe (16) and Australia (02). Besides these, they are hailed from other countries or regions such as: Mediterranean region (06), China (08) Arab and Japan (04 each), Malaysia (04), Mexico, West Indies and Persia (03 each), Ceylon (Sri Lanka), Persian Gulf, Asia Minor, Malay Archipelago and Afghanistan (02 each). Other regions or countries shared a single species each e.g. Malaya, Guiana, Indochina, Eurasia, Mongolia, Sino-Japanese, Ethiopia, Fertile Crescent, Greece, Pakistan and North Temperate Region. It appeared that the distant American continent shared a fair representation in bioinvasion in India.

As stated above, a fair number of plant species appeared to be of foreign origin. On their in-depth investigation, they are deciphered belonging to different continents, countries; geographical regions, etc. belonging to both Old and New Worlds. These exotic plant species are brought in Indian landmass intentionally for medicinal as well as other miscellaneous purposes. The wild species, however, appear invaded negligently or naturally by their dispersal or through migration or communication by mankind over a long past. It has become essential knowing alien plant species in a given region or nation to manage and conserve their indigenous biodiversity. The information obtained through the gleanings of such ancient lexicon will be helpful while extending measures to manage or conserve native biodiversity.

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Table-I: Exotic Plant Species In Raja Nighantu

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
1.	Shweta shigru	*Moringa oleifera* Lam. Moringaceae	C	Tree	America: Singh & Srivastava, 2000.
2.	Palandu	*Allium cepa* L. Liliaceae	C	Herb	(i) West Asia: Naik, 1998; Patil, 2003. (ii) Persia: Bailey, 1949. (iii) Central Asia: Shah, 2014. (iv) Western Temperate Asia: De Candolle, 1959.
3.	Jambira	*Citrus aurantifolia* (Christm.) Swinge. Rutaceae	C	Tree	(i) Malaya: Singh *et al.*, 2000. (ii) Guiana: Almeida, 1996. (iii) Malaysia: Yadav & Sardesai, 2002. (iv) South China & Indo China: Pullaiah & Rao, 2002.
4.	Draksha	*Vitis vinifera* L. Vitaceae	C	Climber	(i) South-East Europe & West Indies: Singh *et al.*, 2000a; Patil, 2019. (ii) West Indies: Gaikwad & Garad, 2015. (iii) Asia (Excl. India) & Europe: Stewart, 1972.
5.	Kasamarda	*Cassia occidentalis* L. Caesalpiniaceae	W	Shrub	South America: Patil, 2003; Chandra Sekar, 2012; Rajagopal & Panigrahi, 1965.
6.	Patha	*Cissampelos pareira* L. Menispermaceae	W	Climber	South America; Rajagopal & Panigrahi, 1965; Panda *et al.*, 2018.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
7.	Krishna-jeeraka, Jeeraka	*Carum carvi* L. Apiaceae	C	Herb	Western Asia, Europe & North America: Patil & Dhale, 2013; Patil, 2020.
8.	Jeeraka	*Cuminum cyminum* L. Apiaceae	C	Herb	(i) South Europe: Yadav & Sardesai, 2002. (ii) Mediterranean Region: Shetty & Singh, 1987; Patil, 1995.
9.	Yavani	*Trachyspermum ammi* (L.) Sprague Apiaceae	C	Herb	(i) South Europe: Gaikwad & Garad, 2015; Yadav & Sardesai, 2002. (ii) Africa: Patil, 1995; Shetty & Singh, 1987.
10.	Varahikanda	*Dioscorea bulbifera* L. Dioscoreaceae	W	Climber	Asia (Excl. India): Stewart, 1972.
11.	Teekshnaka	*Sinapis alba* L. Brassicaceae	C	Herb	(i) Africa & Europe: Stewart, 1972. (ii) Mediterranean Macronesian Regions: Almeida, 1996. (iii) Eurasia: Bailey, 1949. (iv) Mediterranean Region: Novak, 1966.
12.	Arka	*Calotropis procera* (Ait.) R.Br. Asclepiadaceae	W	Shrub	(i) Tropical Africa: Reddy, 2008; Chandra Sekar, 2012. (ii) Persia & Africa: Almeida, 2001a.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
13.	Aragwadha	*Cassia fistula* L. Caesalpiniaceae	C	Tree	(i) North America: Debnath & Dabnath, 2017. (ii) Tropical Asia: Mukhopadhyay & Chakraverty, 2008. (iii) West Indies: Singh *et al.*, 2015.
14.	Kakamachi	*Solanum nigrum* L. Solanaceae	W	Herb	(i) Tropical America: Debnath & Debnath, 2017; Chandra Sekar, 2012. (ii) Europe & America: Almeida, 2001b.
15.	Bhumyahulya	*Cassia auriculata* L. Caesalpiniaceae	W	Shrub	Tropical America: Charan & Singh, 2018.
16.	Chakramarda	*Cassia tora* L. Caesalpiniaceae	W	Herb	South America: Reddy, 2008; Chandra Sekar, 2012.
17.	Dattura	*Datura metel* L. Solanaceae	W	Herb	Tropical America: Srivastava, 1964; Chandra Sekar, 2012.
18.	Rasona, Lashuna	*Allium sativum* L. Liliaceae	C	Herb	(i) Europe: Naik, 1998; Patil, 2003. (ii) Central Asia: Shah, 2014.
19.	Nimbuka	*Citrus limon* (L.) Burm. *f.* Rutaceae	C	Tree	South-East Asia: Yadav & Sardesai, 2002.
20.	Indravaruni	*Citrullus colocynthis* (L.) Schrad. Cucurbitaceae	W	Climber	West Africa: Sainkhedia, 2016; Patil, 2021a.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
21.	Brihat-chunchi	*Corchorus fascicularis* Lam. Tiliaceae	W	Herb	Tropical Africa: Reddy, 2008 Chandra Sekar, 2012.
22.	Yashtimadhu	*Glycyrrhiza glabra* L. Papilionaceae	C	Herb	Arabia, Persian Gulf, Afghanistan, Asia Minor & Siberia: Sawant *et al.*, 2016.
23.	Prasarini	*Xenostegia tridentata* (L.) Austin & Staples (Syn.Merremia tridentata L.) Convolvulaceae	W	Herb	China, Japan & Tropical America: Almeida, 2001b.
24.	Twak	*Cinnamomum verum* . Presl. Lauraceae	W	Tree	(i) Ceylone (Sri Lanka): John, 1891; Singh *et al.*, 2015. (ii) South-East Asia: Novak, 1966.
25.	Yava	*Hordeum vulgare* L. Poaceae	C	Herb	(i) Ethiopia: Fekadu *et al.* 2021a. (ii) Fertile Crescent: Badr *et al.*, 2000.
26.	Shitivara, Siriyari	*Celosia argentea* L. Amaranthaceae	W	Herb	(i) Tropical Africa: Reddy, 2008 (ii) South America: Singh & Inam, 2015.
27.	Ajagandha	*Thymus serpyllum* L. Lamiaceae	C	Herb	Europe: Kaul, 1986; Singh *et al.*, 2001.
28.	Matsyakshi	*Alternanthera sessilis* (L.) R.Br. Amaranthacae	W	Herb	(i) Central America: Panda *et al.*, 2018. (ii) Tropical America: Veerasamy & Arumugan, 2014; Chandra Sekar, 2012.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
29.	Kulatha	*Macrotyloma uniflora* (L.) Verc. Vigna Papilionaceae	C	Herb	South-East Asia: Patil, 2019.
30.	Neela-durva	*Cynodon dactylon* (L.) Pers. Poacee	W	Herb	Tropical Africa: Debnath & Debnath, 2017; Wagh & Jain, 2015.
31.	Rakta-punarnava	*Boerhava repens* var.*diffusa* (L.) Hook.*f.* Nyctaginaceae	W	Herb	(i) South Africa: Struwig & Siebert, 2013. (ii) Tropical Africa: Panda *et al.*, 2018.
32.	Mahabala	*Sida rhombifolia* L. Malvaceae	W	Herb	America: Singh *et al.*, 2015.
33.	Bhringraja	*Eclipta prostrata* (L.) Linn. Asteraceae	W	Herb	South & Tropical America: Reddy, 2008; Patil, 1990, 2017a,b.
34.	Dhattura	*Datura metel* L. Solanaceae	W	Herb	Tropical America: Srivastava 1964; Chandra Sekar, 2012.
35.	Bhallataka	*Semecerpus anacardium* L.*f.* Anacardiaceae	C	Tree	West Indies: Sainkhedia, 2016.
36.	Snuhi	*Euphorbia ligularia* Roxb. (Syn.E.nerrifolia L.) Euphorbiaceae	W	Shrub	Africa: Naik, 1998.

Sr. No. (1)	Sanskrit Plant Name (2)	Botanical Name & Family (3)	Cultivated (C)/ Wild (W) (4)	Habit (5)	Nativity & Reference (6)
37.	Eranda	*Ricinus communis* L. Euphorbiaceae	C	Tree	(i) Tropical Africa: Lesley, 2020. (ii) Africa: Bailey, 1949. (iii) Greece & North Africa; Almeida, 2003b.
38.	Ingudi	*Balanites aegyptiaca* (L.) Delie. Balanitaceae	W	Tree	Africa & Arab: Medakkar & Sharma, 2016a.
39.	Parpataka	*Fumaria indica* (Hussk.) Pugsley Fumariaceae	W	Herb	(i) Pakistan & Afghanistan: Negi & Hajra, 2007. (ii) North Temperate Region: Rajagopal & Panigrahi, 1965.
40.	Babbula	*Vachellia nilotica* (L.) P.J.H. Hunter (Syn. Acacia nilotica L.) Mimosaceae	W	Tree	North Africa & Arab: Rajagopal & Panigrahi, 1965; Purseglove, 1968.
41.	Kasamada	*Cassia occidentalis* L. Caesalpianaceae	W	Shrub	South America: Patil, 2003; Chandra Sekar, 2012.
42.	Brihatpali	*Vernonia anthelmintica* (L.) Willd. [Syn. Centrantherum anthelminticum (L.) Kuntz.] Asteraceae	W	Herb	Malay Archipelago: Mitra & Mukherjee, 2012.
43.	Paribhadra	*Erythrina variegata* L. Papilionaceae	C	Tree	Malaysia: Medakkar & Sharma 2016b.

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44.	Dhuma-patra	*Nicotiana tabacum* L. Solanaceae	C	Herb	(i) Tropical America: Patil, 2003. (ii) America: Bailey, 1949. (iii) Mexico & Central America: Janick, 2013. (iv) Western South America: Wilson, 1994.
45.	Kasha	*Saccharum spontaneum* L. Poaceae	W	Herb	Tropical West Asia: Reddy, 2008; Chandra Shekar, 2012; Singh *et al.*, 2015.
46.	Nishpava	*Lablab purpurea* L. Papilionaceae	C	Climber	(i) Tropical Affica: Debnath & Debnath, 2017. (ii) Africa: Hewson & Thompson, 1993.
47.	Gokshua, Khudra	*Tribulus terrestris* L. Zygophyllaceae	W	Herb	(i) Tropical America: Reddy, 2008; Chandra Sekar, 2012. (ii) Africa Asia (Excl. India): Kaul, 1986.
48.	Kalanjali	*Ipomoea nil* (L.) Roth. Convolvulaceae	W	Climber	(i) North America: Wagh & Jain, 2015; Matthew, 1991. (ii Tropical America & Africa: Almeida, 2001b.
49.	Karpasi	*Gossipium herbaceum* L. Malvaceae	C	Herb	(i) Arabia & Asia Minor: Bailey, 1949. (ii) Africa & Asia: Purseglove, 1968.
50.	Shalmali	*Bombax ceiba* L. Bombacaceae	W	Tree	(i) America & Australia: Mukhopadhyay & Chakraverty, 2008. (ii) Brazil & Argentina: Singh *et al.*, 2015. (iii) Africa: Gaikwad & Garad, 2015.

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51.	Bhustrina	*Cymbopogon martini* (Roxb.) Wats. Poaceae	W	Herb	(i) Afro-Asian: Naik, 1998. (ii) Africa: Yadav & Sardesai, 2002.
52.	Chakramarda	*Cassia tora* L. Caesalpiniaceae	W	Herb	South America: Reddy, 2008; Chandra Sekar, 2012.
53.	Upodika	*Basella alba* L. Basellaceae	C	Climber	East Indies: Singh & Inam, 2015.
54.	Vacha	*Acorus calamus* L. Araceae	C	Herb	(i) South Asia, Central & Western North America: Novak, 1966. (ii) Europe: Almeida, 2009.
55.	Rasona	*Allium sativum* L. Liliaceae	C	Herb	(i) Europe: Naik, 1998; Patil, 2003; Bailey, 1949. (ii) Central Asia: Shah, 2014.
56.	Mukhalu	*Raphanus sativus* Linn. Brassicaceae	C	Herb	(i) Western Asia: Purseglove, 1968. (ii) China, Japan & West Asia: Voight, 1845. (iii) Europe & Temperate Asia: Patil, 1995. (iv) Europe: John, 1891.
57.	Hasti-khoshataki	*Luffa acutangula* Roxb. Cucurbitaceae	C	Climber	Tropical Asia: John, 1891.
58.	Kusumbha	*Carthamus tinctorius* L. Asteraceae	C	Herb	(i) West Asia: Yadav & Sardesai, 2002. (ii) South-West Asia: Patil, 2003; Cooke, 1958; Gaikwad & Garad, 2015.

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59.	Sarsapa-patra, Asuri	*Brassica campestris* L. Brassicaceae	C	Herb	Mediterranean Region; Almeida, 1996.
60.	Rajika	*Brassica juncea* (L.) Zern. & Coss. Brassicaceae	C	Herb	(i) Middle East & Neighbouring Region: Prakash, 1980. (ii) Eastern Europe & China: Spect & Diedarichson, 2001. (iii) Tibet: Medakkar & Sharma 2016a.
61.	Bijora-nimbu	*Citrus medica* Linn. Rutaceae	C	Tree	China: Roxburgh, 1814.
62.	Pinda-kharjura	*Phoenix dactylifera* L. Arecaceae	C	Tree	(i) Persian Gulf: Patil, 2019. (ii) Africa: Bailey, 1949.
63.	Singhada	*Trapa natans* var.*bispinosa* (Roxb.) Makina Trapaceae	C	Herb	Europe: Kak, 1990.
64.	Chanaka	*Cicer arietinum* Linn. Papilionaceae	C	Herb	(i) Mediterannean Region: Shetty & Singh, 1989. (ii) South Europe: Patil, 1990.
65.	Tila	*Sesamum orientale* L. (Syn.S.indicum Linn.) Pedaliaceae	C	Herb	Africa: Dogra, 2011.
66.	Tikta-tundi	*Coccinia indica* W.& A. Cucurbitaceae	W,C	Climber	Africa: Medakkar & Sharma, 2016a.

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67.	Poogaphala	*Areca catechu* Linn. Arecaceae	C	Tree	(i) Tropical Asia: Gaikwad & Garad, 2015. (ii) Indonesian Archipelago: Ahuja & Ahuja, 2011. (iii) Malaysian Archipelago: Shah, 2015. (iv) Malaysia: Chaphekar *et al.*, 2007.
68.	Katu-tumbi	*Lagenaria siceraria* (Molina) Standl. Cucurbitaceae	C	Climber	Africa: Singh & Nigam, 2017.
69.	Akashvalli	*Cassytha filiformis* L. Lauraceae	W	Climber	Tropical South America: Reena & David, 2023.
70.	Aakhukarni, Drvanti	*Merremia gangetica* (L.) Cufod. (Syn.Ipomoea reniformis Choisy) Convolvulaceae	W	Climber	(i) Afro-Asian: Naik, 1998. (ii) Tropical Asia: Jadhav, 2012. (iii) Tropical America: Medakkar & Sharma, 2016c.
71.	Chivilli	*Portulaca quadrifida* Linn. Portulacaceae	W	Herb	(i) Tropical South America: Reddy, 2008; Chandra Sekar, 2012. (ii) Africa & South America: Kaul, 1986. (iii) North America: Rajagopal & Panigrahi, 1965. (iv) Mediterranean Region: Wilson, 1994.
72.	Gandhatrum	*Cymbopogon citratus* (DC.) Stapf. Poaceae	C	Herb	(i) Malaysia or Ceylon (Sri Lanka): Purseglove, 1968. (ii) South-East Asia & Australia: Singh *et al.*, 205.

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73.	Gokshur-Brihat	*Pedalium murex* Linn. Pedaliaceae	W	Herb	Tropical America: Reddy, 2008; Chandra Sekar, 2012.
74.	Goraksdugdhi	*Euphorbia thymifolia* Linn. Euphorbiaceae	W	Herb	(i) East Africa: Singh *et al.*, 1991. (ii) Tropical America: Gaikwad & Garad, 2015. (iii)Tropical Africa: Yadav & Sardesai, 2002. (iv) Africa: Nairne, 1894.
75.	Kakmachi	*Solanum nigrum* Linn. Solanaceae	W	Herb	(i) Tropical America: Debnath & Debnath, 2017; Chandra Sekar, 2012. (ii) Europe & America: Almeida, 2001b.
76.	Kaknasa	*Martynia annua* L. Martyniaceae	W	Shrub	(i) Tropical America: Patil, 2003; Reddy, 2008. (ii) Mexico & Brazil: Rajagopal & Panigrahi, 1965. (iii) Mexico: Yadav & Sardesai, 2002.
77.	Kumari	*Aloe vera* L. Liliaceae	C	Herb	(i) North America: Patil, 2003. (ii) America: Yadav & Sardesai, 2002. (iii) Mediterranean Region: Bailey, 1945.
78.	Nagbala	*Sida cordata* (Burm. *f.*) Borss. Malvaceae	W	Herb	(i) Asia (Excl. India): Sheikh & Dixit, 2017. (ii) South America: Naqshi *et al.*, 1988.
79.	Rudanti	*Cressa cretica* Linn.	W	Herb	Candia (City of Crete): Almeida: 2001b.
80.	Vasuk-shwet	*Trianthema portulacastrum* L. Aizoaceae	W	Herb	Tropical America: Quereshi *et al.*, 2014.

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81.	Sinduri	*Bixa orellana* L. Bixaceae	C	Tree	(i) Tropical America: Purseglove, 1968; Yadav & Sardesai, 2002. (ii) America: Sorenson, 2005.
82.	Mallika	*Jasminum sambac* (L.) Ait. Oleaceae	C	Shrub	Tropical Asia: John, 1891; Patil, 2021b.
83.	Punnago	*Callophyllum inophyllum* L. Clusiaceae	W,C	Tree	(i) East Africa: Pullaiah & Rao, 2002. (ii) Tropical Asia: Mukhopadhyay & Chakraverty, 2008.
84.	Karpuram	*Cinnamomum camphora* (L.) Nees & Eberm. Lauraceae	C	Tree	(i) Japan: Matthew, 1991. (ii)China & South Japan: Wilson, 1994. (iii) China, Taiwan & Japan: Lesley, 2020.
85.	Kushmand	*Benincasa hispida* (Thunb.) Cogn. Cucurbitaceae	C	Climber	(i) Java: Patil, 1995, 2003. (ii) Japan & Java: De Condolle, 1959.
86.	Chukram	*Rumex nigricans* Hook.*f.* (Syn.R.vesicarius L.) Polygonaceae	C	Herb	South Europe, Africa & South East Asia: Naik, 1998.
87.	Japa	*Hibiscus rosasinensis* L. Malvaceae	C	Shrub	(i) China: Patil, 1995, 2003; Shetty & Singh, 1987. (ii) Sino-Japanese: Singh & Srivastava, 2002.
88.	Sinduvar	*Vitex negundo* Linn. Verbenaceae	W	Shrub	North China & Mongolia: Bailey, 1949.

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89.	Swarnakshiri	*Argemone mexicana* L. Papaveraceae	W	Herb	(i) Tropical America: Shetty & Singh, 1987. (ii) Mexico: Lesley, 2020. (iii) America: Sorenson, 2005. (iv) South America: Chandra Sekar, 2012.
90.	Tulasi, Surasa, Gowri, Bhutagi	*Ocimum tenuiflorum* L. (Syn.O.sanctum L.) Lamiaceae	C	Herb	Northern Coastal Belt of Mediterranean Region: Swamy, 1973.