



REVIEW ARTICLE

# Plant Iconography Vis-A-Vis Plant Invasion in India: Glimpses, Sources and Evidences

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## ABSTRACT

India is a biodiversity rich country as well as mosaic of cultural traditions. Plant invasion has been demonstrated by biodiversity studies in India. Mankind had always determined the status of plant, whether indigenous or exotic and developed with them abstract relationships. The present author revealed a role of 26 exotic plant species in the development plant iconography and simultaneous forces of plant invasion in India even during pre-Columbian period. India being rich in ancient literary sources in the form of Vedas, Puranas, epics, caves, temples, Sanskrit writings etc. and replete with plant references, afforded numerous sources of plant iconography. It is an outstanding resource for research on plant history and diversity. However, study of plant iconography demands a wide collaboration with researchers of different subjects or disciplines. At the same, plant invasion hand-in-hand plant iconography are discussed pertinently in Indian context, a hitherto virgin area of research.

Keywords: Plant Iconography, Exotic Plants, Plant Invasion, India.

## INTRODUCTION

Different views have been expressed on the scope and content of iconography. It is the science of identification, description, classification, and interpretation of symbols, themes and subject matter in the visual arts. The earliest iconographical studies in 16<sup>th</sup> century were catalogues of emblems and symbols collected from antique literature and translated into pictorial terms for the use of artists. Upto the 18<sup>th</sup> century, as a companion to archaeology, it consisted of the classification of subjects and motifs in ancient monuments (cf. Editors, Encyclopaedia Britannica, 1998). Alternatively, iconography is said to be: (i) the traditional or conventional images or symbols associated with a subject and especially a religious or legendary subject, (ii) pictorial material relating to or illustrating a subject, (iii) the imagery or symbolism of a work of art, an artist or a body of art (cf. Merriam Webster, 2021).

The present author emphasized particularly plant iconography, a largely neglected field of research in Indian context. Giraldo-Canas (2013) studied plant iconography of Tajmahal (Agra, India) and analysed 46 plant species representing 42 genera and 26 plant families. He further remarked that studies on Indian plant iconography remained, however, without development. Mohan Ram (2016) focussed 16 plant species simply as iconic flora of heritage significance. He put an emphasis on their iconic features exclusively. The present is an attempt to study iconography exclusively to exotic plant species in India. Antiquity, high population and enormous variability of cultural practices prevail in India. Indians belong to different sects viz., Hindu, Jain, Sikh, Buddha, etc. Moreover, world heritage Vedas, 18 major Puranas besides other minor Puranas, Samhitas, Bramhanas, ancient epics e.g. Ramayana, Mahabharata, ancient works of Sanskrit poets and writers, caves, temples, paintings, archaeological sites, sculptures, etc. are all replete with references to iconic plants. Thus Indian territory and bioculture is a rich source for investigation in plant iconography. One is certainly hardput to select all of them. Some interesting select plant species are being limelighted for the present communication.

## METHODOLOGY ADAPTED

The science of iconography seeks information of an icon by sourcing and correlating textual sources with the evidence of the icon. Therefore, the present authors consulted various written records or documents, whether of primary or secondary nature. These have been cited against each iconic plant species included for the present account. Secondly, exotic plant species are especially selected to divulge plant invasion in ancient past on Indian territory. Their nativity or biogeographical affiliations have been supported by providing the relevant literary sources. This

communication is also aimed at how plant-iconography favoured plant introduction, acclimatization and appropriation of exotic species by the Indians in ancient past. Plant species are arranged alphabetically along with their scientific plant name, family, common names (C.N.), habit, status (wild/cultivated), iconographic features with relevant evidence and their nativity.

## SYSTEMATIC ENUMERATION

### 1. *Achyranthes aspera* Linn. (Amaranthaceae):

C.N.: Apamarga, Aghada. **Habit:** Herb. **Status:** Wild

**Iconographic Features:** (i) Puranas describe its flowers to worship Lord Shiva. (ii) It is essential in various worships by Hindus e.g. Haritalika, Rishi Panchami, Anant Chaturdashi, Mangalagauri and Naoratri, etc. (Sensarma, 1992; Ghate, 1998; D'Rozario *et al.*, 1999; Pawar and Patil, 2008). (iii) It is believed that this plant is ideal to control ill effects of the planet. Its use makes an individual happy, fortunate, educated and lightly respected (Krishna and Amirthalingam, 2014). In Atharveda, it is considered beneficial against evil forces such as hunger, thirst and diseases (Tripathi, 2019).

**Nativity:** Tropics: Medakkar & Sharma, 2016b.

### 2. *Adansonia digitata* L. (Bombacaceae):

C.N.: Gorakashi, Gorakh Amla. **Habit:** Tree. **Status:** C

**Iconographic Features:** (i) Hindus believe it a wish-fulfilling tree. (ii) It is thought one of the nine jewels churned out during ocean churning (Samudra Manthan) (Krishna and Amirthalingam, 2014). (ii) Vaman Purana mentioned its origin from the body of Vishwakarma (Gupta, 1991). (iii) A legend is associated with it that Guru Gorakhnath taught his disciples under this tree (Krishna and Amirthalingam, 2014). (iv) It has a legend associated with Ashok Sundari (dauguter of Lord Shiva). The sage Durvasa was mediating under it. Ashok Sundari was created from this tree to ease his loneliness (Chandare *et al.*, 2008).

**Nativity:** Tropical Africa: Yadav & Sardesai, 2002; Patil, 1995.

3. *Albizia lebbbeck* (L.) Benth. (Mimosaceae):

C.N.: Siris, Shirish, Vaagai. **Habit:** Tree. **Status:** C

**Iconographic Features:** (i) Kamdev (God of Love) is said to use its flowers on arrows of desire (Gupta, 1987; Sood *et al.*, 2005). (ii) Arjuna (Hero in Mahabharata) set off on a pilgrimage and met Lord Maanikka Vannar who came in the form of a Brahmana. He said that he lived under this tree. Both reached the tree. Brahmana gave his staff and ran away with sword of Arjuna. He hid it behind a termite hill. Arjuna prayed to the lord to return it. A voice was directed to take it from the termite hill. Since then, the place is known as 'Vaaloliputhur' (sword hidden in the termite hill). Since Maanikka Vannar disappeared under Shirish tree, it became sacred tree of 'Vaaloliputhur' (Sthala Purana) (Krishna and Amirthalingam, 2014). (iii) Goddess Durga performed penance and worshipped lord Shiva under Vaagai (Shirish) tree to gain energy to fight Mahasasura. The tree is worshipped as Durga (Goddess of Victory) and called 'Kadavul Vaagai' as a symbol of her victory (Krishna and Amirthalingam, 2014). (iv) Some wisdom tree species are associated with different Buddhas. This tree is so associated with Kakusandha Buddha and hence worshipped (Sane and Ghate, 2006).

**Nativity:** Pantropical Africa & Tropical Asia: Bhandari, 1978.

4. *Anacardium occidentale* L. (Anacardiaceae):

C.N.: Kaju, Beejara, Sula or Sala. **Habit:** Tree. **Status:** C

**Iconographic Features:** (i) plant with flowers and fruits is depicted at Jambukeshvara temple. (Tiruchirapalli, Tamil Nadu, India) (built 2500 years back) (Gupta, 1996). (ii) Its nuts (fruits) are also depicted at Bharut Stupa (Madhya Pradesh, India) (dated ca. 200 BC.) (Cunnigham, 1879; Patil, 2019). (iii) Its Sanskrit names are coined at 'Beejara Sula or Sala (Balfour Edward, 1871-1873; Patil, 2019a). (iv) It bears enriched kernels with valuable nutrients, minerals and vitamins (Patil, 2019b).

**Nativity:** Tropical America: Patil, 1995; Yadav & Sardesai, 2002. America: Panda & Das, 2004.

5. *Ananas comosus* (L.) (Bromeliaceae):

C.N.: Ananas. **Habit:** Shrub. **Status:** C

**Iconographic Features:** (i) Its fruit (syncarp) is depicted on the 'Vanamala of Vishnu' in his 'Varaha Avatara' in the Udaygiri cave temple (Madhya Pradesh, India) (5<sup>th</sup> century AD) (Gupta, 1996). (ii) It is similarly depicted at Moti-Shah Ka-Tuk, Shatranjaya Hill Complex, Pitilana (Gujarat, India) (1000 year old) (Singh and Nigam, 2017)

**Nativity:** Tropical America: Sharma *et al.*, 1996; Yadav & Sardesai, 2002.

6. *Annona squamosa* L. (Annonaceae):

C.N.: Sitaphal. **Habit:** Tree. **Status:** C

**Iconographic Features:** (i) Fruits are used in worship of Goddess Parvati during Hartalika puja. (ii) They are also used in worship of Lakshmi during Diwali, called 'Laxmi Pujan' (Pawar and Patil, 2010; Khare *et al.*, 2020). (iii) During period of exile, Lord Rama and his wife Sita, it is said to be associated with them (in epic Ramayana) (Bhishagratna, 1907). (iv) Its fruits sculpted in Bharut and Sanch Stupas (Madhya Pradesh, India) (200 BC.) (Cunnigham, 1879). (v) It is reported from Ajanta caves (Maharashtra, India) (Watt, 1889-1893). (vi) This plant is depicted at Jambukeshwara Shiva temple at Tirchirapalli (Tamil Nadu, India) bearing leaves, flowers and fruits (Gupta, 1996). (vii) Fruits are also depicted in the hands of goddess Durga at Aihole (Karnataka, India) (10<sup>th</sup> century CE). (viii) It is also observed in the hands of various deities e.g. Vishnu from Bengal (9-10<sup>th</sup> century CE), Kartikeya in Madhkesvara temple (Mukhaligam, Andhra Pradesh, India) (8<sup>th</sup> Century CE), Shiva in Kattatiya (12<sup>th</sup> Century CE) and Kukbera at Hoyasaleshvara temple (Karnataka, India) (12<sup>th</sup> century CE) (Krishna and Amirthalingam, 2014).

**Nativity:** Tropical America: Patil, 2003; Gaikwad & Garad, 2015. Tropical America & West Indies: Shetty & Singh, 1987.

7. *Borassus flabellifer* L. (Arecaceae):

C.N.: Palmyra Palm, Sala. **Habit:** Tree. **Status:** C

**Iconographic Features:** (i) In remote past, its leaves were used as writing and painting materials

in southern India, e.g. 'Arthashastra' by Kautilya (Mohan Ram, 2016). (ii) Tadi or Neera, a coolant, nutritious and refreshing drink is favourite in India (Jain, 1991). (iii) A legend is associated in epic Ramayana. Lord Rama shot on arrow at seven trees of 'Sala' stranding in a row which pierced though all of them and also arrow came back into his quiver (Gupta, 1993).

**Nativity:** Tropical Africa: Reddy, 2008; Chandra Sekar, 2012.

8. *Calotropis gigantea* (Linn.) R. Br. (Asclepiadaceae):

**C.N.:** Arka, Mandara. **Habit:** Shrub. **Status:** W

**Iconographic Features:** (i) Lord Maruti (Hanuman) is worshipped by offering garland of its flowers. (ii) Leaves are used as 'Patri' during worship of Ganpati, Shani, Haritalika, Mangalagauri and 'Shusti Pujan', etc. (iii) A Hindu widower woman is first married with this plant species and then married with a proposed husband. (iv) In Skanda Purana, mentioned it to be transformation of 'Sun'. (v) Parvati hid in its flowers to defy demons. (vi) Knotted roots are thought to be abodes to Lord Shiva and Ganesh. Every human individual is borne on certain natal constellation as per the Vedic religion. The specific constellation is conceived as protector of that individual and the said constellation is associated, with specific plant species. The said species is regarded as god. Arka is associated with 'Sraavan' constellation. (Ghate, 1998; Sen Gupta, 1965; Watt, 1972; Sane and Ghate, 2006; Pawar and Patil, 2008).

**Nativity:** Tropical Africa: Patil, 2017; Reddy, 2008.

9. *Canabis sativa* Linn. (Cannabinaceae):

**C.N.:** Bhang, Ganja. **Habit:** Herb. **Status:** W, C

**Iconographic Features:** (i) Leaves and flowers are offered on 'Lingam' during Shivaratri worship. (ii) Intoxicating drink prepared from it is drunk on Holi and Shivratri festivals by Hindus. Lord Shiva is offered this drink first to please him. (iii) A owner of house offers 'Bhang' to visitors after immersion ceremony of idols of Durga. (iv) It is said originated during ocean Churning (Samudra Manthan) by gods and demons. It was thought potent to give a person consuming it, a vision of

the gods (Hajra, 1985; Dutta, 1995; Patil, 2000; Saikia and Nath, 2003; Singh and Pandey, 1998).

**Nativity:** Central Asia: Chandra Sekar, 2012; Asia (Excl. India): Kaul, 1986.

10. *Cassia fistula* Linn. (Caesalpiniaceae):

**C.N.:** Konrai, Bahava, Amaltas, Kanikonna. **Habit:** Tree. **Status:** C

**Iconographic Features:** (i) Its flowers resemble the mystic symbol 'Om', the tree is hence called 'Omkaramalar' (Om flower). (ii) Whenever Lord Shiva embarks on a heroic mission, he is believed to wear garlands consisting its flowers. The flowers are also offered to Lord Shiva during midday Puja (Krishna and Amirthalingam, 2014). (iii) Tying a twine and a cradle to this tree, one is blessed with children and wealth. (iv) Flowers are used during celebration of 'Onum', a festival is Kerala (Krishna and Amirthalingam, 2014). (v) Lord Vishnu once thought that the beauty of this flower should be spread in other parts of the country. He took a bunch of flowers and flew in different directions. Since then, various states of the country received this lovely and calm flower tree (E.Ref.1). (vii) Flowers are used to celebrate Lord Vishnu in Kerala. They are offered in temples and to decorate houses in the 'New Year' as symbols of happiness and good luck (Chauan and Chauhan, 2019).

**Nativity:** North America: Debnath & Debnath, 2017.

11. *Clitoria ternatea* Linn. (Papilionaceae):

**C.N.:** Aparjta. **Habit:** Climber. **Status:** W, C

**Iconographic Features:** (i) Lord Vishnu is associated with Aparajita. In the epic Mahabharata, the sacred conch of Vishnu is a serpent which is named as 'Aparajita'. (ii) The plant is a incarnation of goddess Durga (Williams, 1971). (iii) Roots are collected from its white variety and crushed with rice in water. This extract is administered with cow's ghee to the sufferer possessed by evil spirits (Watt, 1889-1893; Sahoo and Bahali, 2003). (iv) In Atharved, it finds a place in one Rasayana group of medicinal plants. It secures prosperity and prolongation of life (Giffith, 1968).

Nativity: Tropical America: Pursglove, 1968.

12. *Cynodon dactylon* (Linn.) Pers. (Poaceae):

C.N.: Durva, Dub. Habit: Herb. Status: W

**Iconographic Features:** (i) A legend is associated with it. It appeared during ocean churning (Samudra Manthan) by gods and demons. Exceptional beautiful Mohini, who, in fact, was Vishnu himself in disguise, carrying the vessel contains nectar (amrita) was the last one emerged out of the ocean of milk. A fight was started between gods and demons to seek the vessel. Mohini favoured the gods and distributed among them. A few drops of it fell on the earth, from which place arose 'Durva' grass (Verma and Singh, 2017). (ii) It is believed to be a remover of all sins since Lord Brahma resides in its roots. (iii) It is thought to remove all obstacles in life being a favourite of Lord Ganesh to which it is often offered on 10-day festival of Ganapati (Ghate, 1998; Agrawal, 1981; Chaudhari Rai and Pal, 1981; Pawar and Patil, 2000b). (iv) It is believed to be originated from the hair of Lord Vishnu and the drops of 'Amrita'. It is so thought pure and sacred. It is used in worships to purify the place (Anil Kukmar and Yadav, 2004). (v) He who offers 10000 oblations to gods by throwing young 'Durva' into the consecrated fire, he enjoys a long life (Tarkaratna, 1297). Apart from religious consideration, it finds mention about medicinal uses in Rigveda and Atharveda (Tripathi, 2019).

Nativity: Tropical Africa: Debnath & Debnath, 2017; Wagh & Jain, 2015.

13. *Datura metel* Linn. (Solanaceae):

C.N.: Datur. Habit: Shrub. Status: W

**Iconographic Features:** (i) Leaves are used in religious worships by Hindus e.g. Mangalagauri, Haritalika, Ganesh Puja, Ghata-Mahalakshmi, etc. (ii) It is mentioned in ancient Sanskrit scripts viz., Amarkosha, Kamasutra, Matsyapurana, etc. (iii) Flower is depicted in heddress of Lord Shiva at the temple on stone sculpture (10-11<sup>th</sup> century) viz., Uma Maheshwara, Nalambas, Hemavati Anantpur district (Andhra Pradesh, India). (Saikia and Nath, 2003; Ghate, 1998; D'Rozaria *et al.*, 1999; Khare *et al.*, 2020). *Datura* is called 'Unmattam' in Tamil and is known to have been important in the worship of Siva in southern India

between 9<sup>th</sup> - 13<sup>th</sup> century CE (Geeta and Waleed, 2007).

Nativity: Tropical America: Chandra Sekar, 2012; Srivastava, 1964.

14. *Dendrocalamus strictus* (Roxb.) Nees (Poaceae):

C.N.: Bamboo. Habit: Shrub (Bushy). Status: C

**Iconographic Features:** (i) It is a key-stone species which provides food, housing and building materials and numerous valuable domestic goods, traditional crafts, useful as a cradle and stretcher to the funeral ground, musical flute, etc. (Mohan Ram, 2016; Pawar and Patil, 2008). Common names of Lord Krishna e.g. Venugopal, Bansilal, Murali and Muralidhar reflect his association with Venu (Bansuri, Flute) which is made of Bamboo. It is hence revered in India (Verma, and Singh, 2017).

Nativity: Myanmar: Negi & Hajra, 2007.

15. *Helianthus annuus* L. (Asteraceae):

C.N.: Suryaphool. Habit: Herb. Status: C

**Iconographic Features:** (i) A sunflower is sculpted between ear and horn of Nandi, the mythological bull associated with Lord Shiva, at a temple Halabid (Karnataka, India). (ii) A large sunflower is carved on a pillar. Its seed also show eaten by a parrot (Sorenson, 2005). (iii) Seeds are enriched with fatty acids, glucerides, vitamin A, D and E phosphorides (Patil, 2019b) and widely used in Indian cuisine.

Nativity: Western USA: Yadav & Sardesai, 2002; Patil, 2003. Central America & Peru: Coats, 1956.

16. *Hibiscus rosa-sinensis* L. (Malvaceae):

C.N.: Japa, Jasvant. Habit: Shrub. Status: C

**Iconographic Features:** (i) Its flower is thought sacred to the Sun. A sloka is recited with means: "I pray to the Sun, the day-maker, destroyer of all signs, the enemy of darkness and of great brilliance (Birdwood, 1972; Krishna and Amirthalingam, 2014). (ii) Devi Kali was requested by the gods to destroy evil. Jasun was an ardent devotee of goddess Kali. He offered Kali red flowers of Japa to fit into her eyes. Kali being

pleased with his sacrifice gave a boon that the red flower shall be her favorite flower, and henceforth called by names such as 'Jasakusam', 'Deviphool' or 'Jathaon'. The complexion of Kali is compared to the glow of this flower. Its flowers are believed to be the dwelling place of goddess Kali (Gandhi and Singh, 1889; Patil, 2020; Sood *et al.*, 2005).

Nativity: China: Shetty & Singh, 1987; Patil, 2003.

17. *Hordeum vulgare* Linn. (Poaceae):

C.N.: Yava, Jav. Habit: Herb. Status: C

**Iconographic Features:** (i) It is considered a plant of Saturn as a symbol of wealth and abundance, and used in many Hindu religious ceremonies from birth to death. (ii) On the day of festival viz, 'Yuva-Chaturchi' barley meal thrown over each other. (iii) Brahmins keep seedling on the ears on the days of Dasera and Navratri festivals. (iv) To avoid evil spirits and any harm the body of Hindu bride and bridegroom is smeared with a paste prepared by its flour, turmeric powder and scented oil (Watt, 1972; Singh and Pandey, 1998). (v) It contains considerable valuable nutrients and minerals and finds mention in Vedas e.g. Rigveda, Yajurveda and Atharveda (Patil 2019b).

Nativity: Europe & North America: Dar *et al.*, 2002.

18. *Imperata cylindrica* (L.) Raeuschel (Poaceae):

C.N.: Darbha, Dabh, Kusha. Habit: Herb. Status: W

**Iconographic Features:** (i) Lord Rama doubted chastity of Sita as she lived in the palace grounds of Ravana. Sita was sent to forest wherein she gave birth twin sons viz, Lava and Kusa in the hermitage of Valmiki. Rama realised the injustice done to her and fetched her back. Sita saw Rama and felt humiliated, shame and anger at having undergone the fire ordeal to prove her innocence. Sita, daughter of Dharni (Earth), prayed earth to accept back. The earth opened where Sita was standing and got buried under the debris. Kusa could get hold of only Sita's hair, which turned into a grass. This grass is named after her son Kusa. Since then, this grass is thought sacred (Shastri, 1957; Gupta, 1991; Patil, 2020). (ii) Sanskrit word 'Kusha' means sacred. Rigveda

mentioned it as Darbha and also in Atharveda. It is used to calm anger. It is rich in possessing roots and 1000 leaves and 100 stalks (culms). Vaishnavites consider this grass a personification of Lord Vishnu. It has a virtue of purifying everything and hence used in all ceremonies (Krishna and Amirthalingam, 2014). (iii) Lord Rama was perplexed about how to cross sea while bringing back his consort Sita. He chose a bed of 'Darbha' grass to perform penance for three days and nights. Then Shri Adi Jagannatha appeared before him. He handed him the weapon of victory, the 'divya chapa' and blessed him. The place is known as 'Tirupullani' and the deity as 'Darbha-Sayana Rama' (Krishna and Amirthalingam, 2014).

Nativity: Tropical America: Reddy, 2008; Debnath & Debnath, 2017.

19. *Lawsonia inermis* Linn. (Lythraceae):

C.N.: Mendhi, Kuravaka. Habit: Shrub. Status: C

**Iconographic Features:** (i) Leaf paste is applied to dye red hand palms by married women particularly on the days of 'Karva Chauth', Hartalika, Tij, etc. This is performed to pray for long life of husbands. (ii) It is offered to goddess Durga during Navratri festival being auspicious. (iii) Hand palms and food soles are dyed using leaf paste especially on auspicious occasion e.g. marriage, Diwali, Raksha Bandhan, etc. (Vihari, 1995; Saikia and Nath, 2003; Bhatt *et al.*, 2001; Pawar and Patil, 2008). (iv) It is a symbol of welcome and also offered to Saraswati (Goddess of Knowledge) (Chaudhari and Pal, 1981). (v) Dyed hands and feet are observed in the Ajanta paintings '(Ajanta caves, Aurangabad district, Maharashtra, India) on men, women, deities and demons (Patil, 2019a).

Nativity: Middle East: Gaikwad & Garad, 2015. Arabia & Persia: Shetty & Singh, 1987.

20. *Nerium indicum* Mill. (Apocynaceae):

C.N.: Karavira, Kanher. Habit: Shrub. Status: C

**Iconographic Features:** (i) It is thought sacred by Hindus and offered to Lord Shiva. (ii) Ling-Purana states that Lord Ganesha resides on its flowers. (iii) Leaves are used in worships e.g. Mangalagauri, Hartalika, Ganesh Puja, Ghata-



Mahalakshmi, etc. (Sensarma, 1992; Sen Gupta, 1965; Ghate, 1998; Watt, 1972).

**Nativity:** Mediterranean Region: Purseglove, 1968; Singh *et al.*, 1991; China, Cochin China: Voight, 1945.

21. *Nicotiana tabacum* Linn. (Solanaceae):

C.N.: Tambakhu. **Habit:** Herb. **Status:** C

**Iconographic Features:** (i) Mythological story is associated with Lord Mahadeva. After marriage with Parvati, he always used to demand food. He kept asking food for many years. Parvati could not bear his persistent demand of food. She went to forest and prayed to Vanaspad (Lord of Vegetation) and asked him to make her husband love her. She picked up leaves from forest, rolled one, powdered another one and filled the pipe with it. She left the pipe near the food, Mahadeva asked for food. She put a little fire into the pipe and gave to him; Mahadeva smoked it and soon forgot about food. Parvati then grew the plant of tobacco in her garden for easy access to Mahadeva. Tobacco thus become known to mankind (Gupta, 1981; Patil, 2020). (ii) A king had an ugly daughter. He worried about her marriage. The girl grew in years and become adult. No one married her inspite of all temptations. She killed herself in desperation. Gods gave a boon at the time of her death that in whatever form she came back for earth, she would be loved and desired by mankind. She was cremated after death. The tobacco plant loved by men grew from her ashes (Gupta, 1981; Patil, 2020). (iii) A water-cooled device 'Hooka' is present on temple in Himachal Pradesh (dated 1422-1424 AD) used for tobacco smoking (Singh, 2016).

**Nativity:** Tropical America: Patil, 2003; Gaikwad & Garad, 2015. America: Bailey, 1949; Purseglove, 1968. Mexico & Central America: Janick, 2013.

22. *Piper betle* Linn. (Piperaceae):

C.N.: Tambula, Pan. **Habit:** Climber. **Status:** C

**Iconographic Features:** (i) Leaves are used in all religious ceremonies of Hindus and offered to deities along with betel-nuts (Sood *et al.*, 2005). (ii) Leaf being sacred to Hindus, believed to be the personification of the palm of goddess Lakshmi (Subramanyam, 1979). (iii) Its origin believed

from residual drop of 'Amrita' that fell on lands of serpents (snakes). Its Sanskrit name 'Nagavelli' sprouted in the land of 'Nagas' (Serpents) (Jana, 1995; Patil, 2020).

**Nativity:** Bali & East Indies: Graf, 1980.

23. *Tamarandus indica* L. (Caesalpinaceae):

C.N.: Tamarind. **Habit:** Tree. **Status:** W, C

**Iconographic Features:** (i) Because of acidic pulp being rich in vitamin-C, tartaric, malic and citric acids, its fruits are used extensively in Indian cuisines, besides as sauce, chutneys, souring agent, refreshing drinks, etc. It is also employed to polish utensils of brass, copper and bronze (Mohan Ram, 2016; Jain, 1991; Ambasta, 1986; Patil and Dhale, 2013). (ii) King Dasharatha of Ayodhya exiled his son Rama He went with his wife Sita and younger brother Lakshmana. They took shelter in a forest and built a hut under the Imli (Tamarind) tree. The tree had large leaves and sheltered the hut from sun and rain. Rama was not, however, happy. He thought that his father sent us to face hardships. On this situation, Lakshmana shot a series of small arrows on this tree. The large leaves spilt into fringes which could not protect the princes. The leaves have still remained so to this day (Shastri, 1957; Patil, 2020). (iii) There is also another legend, Bhasmasur, the chief of Asuras, challenged Lord Mahadeva. It was decided that the winner would become the ruler of earth. Bhasmasur was wounded and ran away and climbed up Tamarind tree and covered himself by large leaves. Mahadeva opened the magical third eye. Each leaf disintegrated into small pieces. He then killed Bhasmasur. The leaves, however, have remained small forever (Krishna and Amirthalingam, 2014; Patil, 2020). (iv) Sita cooked food under this tree, but the rain put out the fire. Lord Rama ordered his younger brother Lakshmana to send a letter of protest to the 'Rain God' to stop raining. He tied the letter to the arrow and shot it to the sky. The tree personifies the 'God of Rain'. It is worshiped for good season during Pasarupanduga holiday (Verma and Singh, 2017).

**Nativity:** Africa: Pullaiah & Ramamurthy, 2001. Tropical America: Shetty & Singh, 1987.

24. *Vitis vinifera* Linn. (Vitaceae):

C.N.: Draksha, Angoor. **Habit:** Climber. **Status:** C

**Iconographic Features:** (i) According to Matsya Purana, the grapes made of silver should be presented to Brahmanas at the end of a vrata for Lord Shiva (Akhtar, 1972; Sri Vyasadeva, 1892). (ii) In Vishnu Purana, it is stated that king Prithu organized a grand 'Yagna'. At the time of 'Somabhishek' (Bathing with grape wine) during this 'yagna', a man and a woman appeared out of the earth. Goddess Varuni (Goddess of Vine) and 'Sura' came out next. The gods readily accepted 'Sura' and thus they came to be known as 'Suras' (Wilson, 1961).

**Nativity:** South-East Europe to West Indies: Singh *et al.*, 2000. West Asia: Gaikwad & Gorad, 2015. Asia (Excl. India) and Europe: Stewart, 1972.

25. *Zea mays* L. (Poaceae):

C.N.: Maka, Makai. **Habit:** Herb. **Status:** C

**Iconographic Features:** (i) Its cob is depicted on one left hand of Mohini, a female form of 8-armed dancing Lord Vishnu (a Hindu god) at the Lakshmi Navasimha temple, Nugehalli (Karnataka, India), a temple thought built 12-13<sup>th</sup> century (Gupta, 1996). Yellow colour is thought dear to Lord Vishnu and hence yellow cobs are appropriated to him (Khare *et al.*, 2020).

**Nativity:** Central America: Purseglove, 1972; Backer & Brink, 1968.

26. *Zizyphus mauritiana* Lamk. (Rhamnaceae):

C.N.: Badara, Badari, Bor. **Habit:** Tree. **Status:** C

**Iconographic Features:** (i) Leaves are used in various religious worships e.g. Navratri, Ganesh Puja, Mangalagauri, Ghata-Mahalakshmi, etc. (ii) A branch is used as a symbol of 'Prahlad' and kept it in fire at the 'Holi' festival. If a boy takes it first out of fire, he gets bride of his choice. (iii) Fruits and heart-wood are used in making rosaries and beads for worshipping. (iv) In Brahmins, a twig is used by a bridegroom to touch 'Toran' before the entry in bride's house at the time of marriage (Agrawal, 1981; Sen Gupta, 1965; Singh and Pandey, 1998; Gogoi and Borthakur, 1991; Gopal and Sinha, 2000). (v) Badari is sacred to Lord Vishnu, hence called Badarinath (Lord of Badari).

This name is derived from it and it being associated with sulphurous spring and ancient tree cult (Krishna and Amirthalingam, 2014). (vi) When Sita abducted by Ravana, Rama and Lakshmana asked Badari about of Sita. This tree answered affirmative and pointed out the direction in which Sita had been forced to go with Ravana (Gandhi and Singh, 1989). (vii) It is viewed with reverence by the Sikhs since Guru Nanak Dev planted a sapling of it on the banks of river, Bein. Also, Guru Gobind Singh stayed under this tree in a village of Seelona (Ludhiana district, Punjab). Both of these sites are converted into Shrines. Baba Buddha (1506-1621) used to sit under it near a pool at the Amritsar Golden Temple. It is now worshipped by devotees (Sikarwar, 2016).

**Nativity:** Tropical Warm Subtropics: Martin *et al.*, 1987. Australia: Veerasamy & Arumugan, 2014.

## RESULTS AND DISCUSSION

## (i) Foreground of Plant Iconography:

Ambient nature fascinated the mankind since his appearance on the Blue Planet. Drawing bioresources to his advantage or sustenance can be conceived as a necessity of human life. But why plants (or animals) are worshipped, sculpted or depicted by him? Probably his ideology led him to the development of abstract relationships with which he associated or appropriated plants with some faith, fear or beliefs. Plants play an omnipresent role in various societies and in different contexts. Mankind, as evident throughout his history, appear to have deciphered the status of plants based on different approaches e.g. first welfare for man himself, second, existential perception of plants and third, recommendation of religions on account of some peculiar functions or features of plant species. Literary or art works on various monuments, temples, caves, paintings, etc. transform into myths, legends, faith or beliefs by a prominent description. This process may even create some kind of sacredness for the plants under his consideration. Legends pertaining to the plants are luminative of the mental process of our ancestors. The various sources of iconography are of utmost significance for the accession of information which earmark the past relationships or associations between mankind and his environment.

## (ii) Present results:

(a) **Floristic analysis:** As many as 26 plant species pertaining to 26 genera and 20 angiospermic families are presently considered which are venerated or valued by the Indians in their routine life, customs, rituals, rites, cuisine and welfare. Of, these, dicotyledons have major share (19



species, 17 genera and 17 families) as compared to the monocotyledons (07 species, 07 genera and 03 families). They belong to various habitat categories viz, trees (08), herbs (08), shrubs (07) and climbers (03). The figures in parenthesis stand for number of species. Interestingly, majority of them are found under cultivation (18 species) for different purposes, whereas few species run wild or have naturalised (05 species) and integrated with the Indian biodiversity. Few ones (03 species are either wild or cultigens).

**(b) Utilities:** These plant taxa are, in general, being primarily used by the Indians. Indians have realised their various potentials and accordingly bioprospeted for different uses or applications in their routine life. Thus these taxa have unified with Indian bioculture and sustenance. These can be analysed as: (i) Food and drink: *Borassus flabellifer*, (ii) Edible fruits and nuts: *Annona squamosa*, *Ananas comosus*, *Anacardium occidentale*, (iii) Food grains: *Hordeum vulgare*, *Zea mays*, (iv) Oil-Yielding: *Helianthus annuus*, (v) Chewing and religious: *Piper betle*, (vi) Cosmetics: *Lawsonia inermis*, (vii) Narcotics: *Cannabis sativa*, *Nicotiana tabacum*, (viii) Religious: *Achyranthes aspera*, *Calotropis gigantea*, *Cynodon dactylon*, *Datura metel*, *Imperata cylindrica*, (ix) Shade tree: *Albizia lebbek*, (x) Miscellaneous and domestic uses: *Dendrocalamus strictus*. Hardly, there is any compartment of human life which is not served by these exotic species. Interestingly, these have perforce been conserved to date.

**(c) Nativity (Origin) of Exotic Species:** All these exotic taxa are evaluated for biogeographical origin vis-a-vis their nativity. In all, they exhibited as many as 14 biogeographic regions, either continents, countries, particular geographical regions, or islands. They represent various parts of continents of both Old and New Worlds such as: America (11), Africa (06), Europe (03), Asia excl. India (02); Countries e.g. China and Cochin China (02 each), West Indies (02), Arabia and Persia (01), Bali (01), East Indies (01), Australia (01); geographical regions e.g. Tropics and subtropics (02), Middle East (01) and Mediterranean Region (01). The figures in parenthesis represent number of exotic species. It appears that American species have contributed for maximum share in plant invasion in India, which is then followed by Africa. Other continents, countries or geographical regions contributed by very few species or even a single species each.

#### **(d) Plant Iconography and Invasion:**

First Plant iconography is a multidisciplinary study. It is obviously a collaborative venture between botanists particularly taxonomists, historians, artists, etc. It cannot be investigated in isolation. The nature and sources are, therefore, varied and information can be

derived from as many disciplines as possible for a subject under consideration. India has a strategic geographical position between the East and West. Its cultural and natural interconnectivity suffice explanation for diverse culture and contacts of its denizens. It is further noted that *C.gigantea* (African species) *Datura metel* and *Cassia fistula* (American species) even find mention in oral and written Tamil tradition (on palm-leaf manuscripts) by saints viz., Tirujn-Anasambanda and Tirujn-Avakkaracu in their songs. They are believed to have lived in the 7<sup>th</sup> century CE. (Geeta, Waleed, 2007). Thus, these plant species had established in southern India in pre-Columbian period. Majority of literary evidences in this account are also pre-Columbian. The aforesaid revelations indicate human contacts between different continents and countries of the both New (America) and Old Worlds. The exotic species have invaded in Indian landmass in different eras. The forces of plant invasions belong to two categories. The cultivated exotic species are brought in purposefully to help supplement or add daily various human necessities of life. Thus, it is man-engineered activity. The invasion of wild exotic species is generally indicative of negligent behaviour towards them by the mankind himself or possible because of natural dispersal of plants or diaspora. Plants are dispersed to short or long distances by various methods, biotic or abiotic (water and air) (Patil, 2020). Plant iconography is also the result of man-engineered activity. Plant invasion is partly successful due man as stated above. Exotic species are first introduced and eventually established in a given environment and edaphic circumstances. Man has later on developed abstract relationships with the plants after their establishment and long-standing association. They are then appropriated or bioprospeted for various purposes depending upon the local needs of a human population. Thus they are also conserved. They are rendered as iconic plants and become integral part of bioculture. The rare plant invasion is thereby accelerated by the process of becoming iconic and iconography. The present author is, therefore, inclined to state that plant invasion, in a specific territory, goes hand in hand with plant iconography or sometimes even eventually.

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