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Indian traditional trees and their scientific relevance

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Abstract

India is a traditional country. If we see the history of Indian tradition, we find that trees were treated as God and Goddess in ancient Indian tradition. Ancient Harappa civilization gives us many evidences of tree prayer. We find the evidence of Aranyani who was a goddess of forests in ancient Hindu religion. Many hymns of *Rigveda* were dedicated to Aranyani. Other Indian religions like Buddhism and Jainism also showed their devotion towards trees. Buddhism believes on the concept of Varshavas. In this concept Buddhist monks used to stay on one place for three months. They believed that during rainy session many new plants and crops grow. If they would go out, these new small plants would throttle under their feet. The present review throws light on the culture of tree worship in India and its scientific relevance in present science era.

Keywords: Indian traditional trees; tree worship; medicinal values; APTI

Introduction

By studying ancient Indian society, it is found that ancient Indian society had very close relation with environment. Our forefathers passed their life in the forests they related trees with religious and nature. Plants and nature worshiping was very common ritual in Harappa civilization. An image of *Peepal tree (Ficus religiosa L.)* has been found on a seal from Mohenjo-Daro. Tree and nature worshiping were performed in the *Vedic* period also. Many religious practices were directly related with tree and nature-worshiping. If we see ancient god and goddesses, we find that many god and goddesses like, Sun, *Soma* (the god of drinking liquids), *Agni*, (god of fire), *Varun* (god of water), *Usha* (goddess of morning), *Saraswati* (goddess of river, later turned into goddess of knowledge) and Pushan (god of animals) etc. were worshiped. Our ancestors knew the importance of trees and used them as a source of medicine (Pandey & Pandey, 2016. 136) ^[13]. Many people took birth on Indian soil in ancient time who wrote many literatures on naturopathy. Charak wrote a book named, '*Charaka Samghita*'. Susrut and Dhanvantari also had deep knowledge of naturopathy. Our ancestors were close to the nature, therefore, they developed their daily practices according to the nature and natural laws. They were more nature protecting than we, the modern men. Many religious practices were directly related with environment.

Indian tradition of tree worshiping

Indian civilization is one of the most ancient civilizations in the world. Earlier, human being got food and clothing from the forests. Human being started settled lifestyle in Indian sub-continent in Neolithic age. Human civilization developed with the development of environment. There are many examples of tree worshiping in Harappa civilization. Indian civilization emphasized on tree worshiping and made many natural symbols as their god and goddess. Indians worshiped natural bodies like the Sun, the Moon, the Earth, rivers and many trees. They worshiped natural things because they knew that they could not survive without environment. Human beings found food and shelter from the environment. Our ancestors knew the relevance of trees, therefore, they not only saved them but also worshiped them (Pandey, 2014. 32-33+101-138) ^[14]. In Indian tradition, trees have been given more importance because our ancestors were of the view that trees have also life like human being and they can also feel pain and happiness. Our ancestors related trees with spirituality because they knew their relevance and worshiped them as their god and goddess. Sanctity. There are many examples in history that suggest us that ancient Indian people associated different trees with various god and goddess.

For example, bel (*Aegle marmelos*) and *Rudraksha* (seed of *Elaeagnus*) were associated with lord Shiva, *Peepal* tree was associated with lord Vishnu, Mango (*Mangifera indica*) was associated with lord Hanuman and *Ashoka* tree was associated with lord *Kamadeva* (Kaur, 2013) [8].

Vedic civilization brought significant changes in tree worshipping. Vedic civilization begins in India from about 1500 BCE. This civilization was developed by the Aryan People. These Aryan people invented medical importance of trees. These Aryan people introduced the knowledge of Ayurveda. The literal meaning of Ayurveda is 'the knowledge of increasing age'. Indian *Vedas* refer the knowledge of medicines and medical. Sankya Yoga and *Vaisheshik* Philosophy refer medical knowledge in their literatures. In 3rd and 2nd century BC. Some texts were written on naturopathy. *Charaka Samhita* of Charaka is one of the most important book on naturopathy of this time. This book is divided into 120 chapters which are arranged in 8 sections (Singh, 2009. 543-545) [20]. In India, there are many trees that are been worshipped and have medical relevance. These trees are as follow:

Tulasi (*Ocimum tenuiflorum*) tree worship and its medical importance

Tulasi tree is one of the most sacred trees in India. It is used in worship and it can be reused again after washing because it is regarded so self-purifying. In our Vedic tradition, tulasi symbolises goddess Lakshmi. It is believed that those who wish to have a happy family and want to be righteous, they worship the tulasi. The tulasi leaf is very valuable from the perspective of medical sciences because it is used to cure many diseases including the common cold (Hindu Rituals Routines, nd. 12) [8]. Tulasi is important from spiritual as well as health point of view. It is used in fever. It has very potent germicidal, anti-bacterial, fungicidal and anti-biotic properties. It is useful in diabetes and protects the heart. According to Central Drug Research Institute, Lucknow, Tulasi helps to maintain the normal level of stress hormone. Tulasi has anti-oxidant and anti-carcinogenic properties; therefore, it is very useful to stop increment of breast cancer and oral cancer. Tulasi has anti-stress compounds so, it is helpful to quit smoking. It is used in headache cure. Tulasi is used in beauty cosmetics also (Sampath, 2013) [17].

Peepal (*Ficus religiosa*) tree worship and its medical importance

Peepal tree is also very sacred tree in Indian tradition. This tree is associated with Yama, the god of death. Any grass cannot grow under this tree and this tree does not offer any fruit. So, this tree is not used in any fertility ceremonies (Prabhakar, 2018) [14]. During Vedic period, Peepal tree was known as *Ashwattha*. This tree is considered as the king among the trees. Atharva Veda mentions this tree as destroyer of enemies. In *Puranas*, the Peepal tree is named as Kalpa

Vriksha. Skanda Purana refers that the worship of Ashwattha destroys all misfortunes (Anupama, 2014) [4]. Many stories are related with this tree that makes it sacred in Hinduism. Hindus believe that goddess Lakshmi resides in this tree every Saturday. It is believed that when lord Hanuman went to Shree Lanka in search of Sita, the wife of lord Rama, He used to sit upon this tree. *Brahma Purana* refers that Lord Vishnu was born under a Peepal tree. It is also believed that Lord Brahma, Vishnu and Shiva used to hold their council under the Peepal tree. Hindu mythology believes that our ancestors' soul resides in Peepal tree. Therefore, Peepal tree has very significance in Hinduism. This tree is important for the medical purpose also (Molasi, 2017) [10]. Peepal is used in Ayurveda. It is used in many infections, improves fertility and treats poisoning. The leaves of Peepal are used in constipation and jaundice. Its fruits or figs are useful for digestion (Anupama, 2014) [4]. In this way, Peepal tree has great significance in human life. It is important from both, health and environmental point of view.

Banyan (*Ficus benghalensis*) tree worship and its medical importance

Banyan tree has very significant place in Hindu mythology. This tree also symbolizes trimurti like, the bark is considered as Lord Vishnu, roots are considered as Lord Brahma, and branches are considered as Lord Shiva (Venkat, 2017) [20]. This tree is known for other names also like Bargad, Ala, Bor, Pedda mari Nayagrodha etc. It is a huge tree and has extensive branches; therefore, more than 10,000 people can sit at one time under this tree. This tree is important for social as well as medical perspective. In social relevance, it is used as sacred tree. Its leaves are used to make plates. This tree is useful in soil conservation. In medical importance, it is used to cure various diseases like polyuria, dental, urine disorder etc. (Eco India).

Neem (*Azadirachta indica*) tree worshipping and its medical importance

Neem tree is cultivated in the Indian sub-continent. This tree belongs to mahogany family, *Meliaceae*. Its botanic name is *Azadirachta indica* (Kumar and Navaratnam, 2013) [8]. It is used for medical purpose. It is used to make anti-bacterial, anti-fungal and anti-viral. In Hindu culture, it is believed that Goddess Sitala Devi exists in this tree. South Indians believe that Goddess Marimman is associated with this tree. This Goddess is responsible for giving and healing of skin ailments like small-pox (Venkat, 2017) [20].

Plants not only convert the raw energy of the sun into the nutrients needed for human life but also they can repair and restore their body, slow the effects of aging, and even expand your awareness. The understanding of medical and spiritual therapeutic power of plants gives us practical wisdom to improve daily life and knowledge of the nature. Medicinal values of above tree species have been described in table 1.

Table 1: Indian traditional tree and their medicinal values.

S. No.	Trees	Medicinal value	Authors
1.	<i>Azadirachta indica</i>	Bark, leaves, and seeds are used to make medicine. Less frequently, the root, flower, and fruit are also used as a medicine.	Kumar <i>et al.</i> , (2013) [8]
2.	<i>Ficus religiosa</i>	All part of <i>Ficus religiosa</i> tree like bark, leaves, and roots are used as herbal medicine to cure many chronic diseases.	Alok Tirpathi and Arvind Kumar (2013) [3]
3.	<i>Ficus virens</i>	<i>Ficus virens</i> tree is used for the treatment of diabetes. This plant conserve biodiversity as well as cultural diversity which have direct effect on environment.	Khan <i>et al.</i> (2011)
4.	<i>Ficus benghalensis</i>	Plant leaf of <i>Ficus benghalensis</i> is used as ulcer protective, leprosy, fever, inflammations (Ayurvedic) and Milky juice is useful to aphrodisiac, tonic, vulnerary, maturant and also useful in piles, diseases of the nose, Gonorrhoea.	Patel and Gautam (2014)

5.	<i>Ocimum tenuiflorum</i>	Tulasi (<i>Ocimum tenuiflorum</i>) is a popular home remedy for many ailments such as wound, bronchitis, liver diseases, hiccough, ophthalmia, gastric disorders, genitourinary disorders, skin diseases, various forms of poisoning and psychosomatic stress disorders.	Lai and Roy (2004) ^[9] ; Fabricant and Farnsworth (2001) ^[6] .
6.	<i>Albizia lebbek</i>	<i>Albizia lebbek</i> has many medicinal properties like Antiseptic, antibacterial, anti-allergic, antidermatotic, antidysenteric etc. this plant is also used in the treatment of Bronchitis, piles, hemicranias, cough, tropical pulmonary eosinophilia, asthma etc.	Vijay Choudhary (2019) ^[21]
7.	<i>Cassia fistula</i>	<i>Cassia fistula</i> is employed as a remedy for tumors of the abdomen, glands, liver, stomach, and throat, for burns, cancer, constipation, convulsions, delirium, diarrhea, dysuria, epilepsy, gravel, hematuria and pimples.	Pawar <i>et al.</i> , (2017) ^[11]

Indian spiritual trees and their environmental relevance

Urban vegetation affects air quality through influencing pollutant deposition and dispersion. Plants play an important role in the removal of pollution. The dense area of plants helps in eco-sustainable filtration unit of air pollution. Air pollutant may cause adverse effect on environment (Rai *et al* 2013) ^[16]. Plant leaf surface, acts as sink of pollution deposition through specific morphological, physiological, and biochemical responses. Deposition of pollutants on a leaf surface induces structural and functional changes (Panda and Rai 2015) ^[15]. The efficiency of particulate capture reduces when the leaves are covered with dust and oil from the vehicular pollution. Trees are also rain producers since the evaporation of water from their leaves changes the microenvironment and helps in rain precipitation. Increased rain can also reduce air pollution.

Although plants are very important to maintain urban ecosystem health yet they may, however, be severely affected by pollution (Panda and Rai 2015; Shweta 2012) ^[15, 18].

Therefore, plants should be considered as an integral part of any comprehensive plan aimed at improving overall urban air quality and concomitantly. They assist in following an eco-sustainable approach (Abida *et al* 2009; Panda and Rai 2015 ^[15]; Chaudhary and Rathore, 2018) ^[5].

Tree species show considerable variation in their susceptibility to air pollution. On the basis of air pollution tolerance index with highest APTI can be considered as most tolerant tree species against air pollution (Chaudhary and Rathore 2018) ^[5]. The basic concept of these trees was higher APTI denoted as spiritual tree and also medicinal values as most suited plant species for sustainable urban forestry (table 2). For the better understanding of Selection of plant species for plantation in urban areas which is most efficient for to pollution removal efficiency and their air pollution tolerance power of plant species and also as its medicinal values. This review revealed that design and choice of urban vegetation is crucial when using vegetation as an ecosystem service for air quality improvements.

Table 2: Indian traditional trees and their air pollution tolerance powers.

S. No.	Plants species	APTI	Authors
1.	<i>Ficus benghalensis</i>	43.35	Chaudhary and Rathore (2018) ^[5]
2.	<i>Ficus virens</i>	38.14	Chaudhary and Rathore (2018) ^[5]
3.	<i>Dalbergia sissoo</i>	16.59	Navjot <i>et al.</i> , 2016 ^[11]
4.	<i>Albizia lebbek</i>	7.44	Babu <i>et al.</i> , (2013)
5.	<i>Cassia fistula</i>	28	Mark (1997)
6.	<i>Azadirachta indica</i>	25.92	Chaudhary and Rathore (2018) ^[5]
7.	<i>Ficus religiosa</i>	47.45	Chaudhary and Rathore (2018) ^[5]
8.	<i>Psidium guajava</i>	18	Mark (1997)
9.	<i>Phyllanthus emblica</i>	14	Mark (1997)
10.	<i>Tamaridus indica</i>	14	Chakre (2006)
11.	<i>Moringa olifera</i>	12	Chakre (2006)
12.	<i>Tectona grandis</i>	6	Chakre (2006)
13.	<i>Mangifera indica</i>	12	Chakre (2006)

Conclusion

The conclusion of the present review throws light on the culture of tree worship in India and its scientific relevance in present science era. If we see the history of Indian tradition, we find that trees were treated as God and Goddess in Indian tradition. Lot of pharmacological and environmental freshness work has been scientifically carried out on various part of traditional plants some other traditionally important the therapeutically uses are also remaining to proof till now scientifically. The various chemical constituents and morphological characteristic show medicinal value and pollution removal efficiency and pollution tolerance power against pollution generated by anthropogenic activity. It can be said that in ancient era, spiritual trees were used as an environmental protection and also medicinal properties. Therefore, our ancestors protected trees. In contemporary society, human being is emphasising on economic development, therefore, they have exploited the nature and destroyed the forests. If we want to sustain the earth and

humanity, we will have to protect trees.

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