Azim Premji University

THE TREES IN OUR LIVES:

TREES AROUND THE SOMPURA CAMPUS

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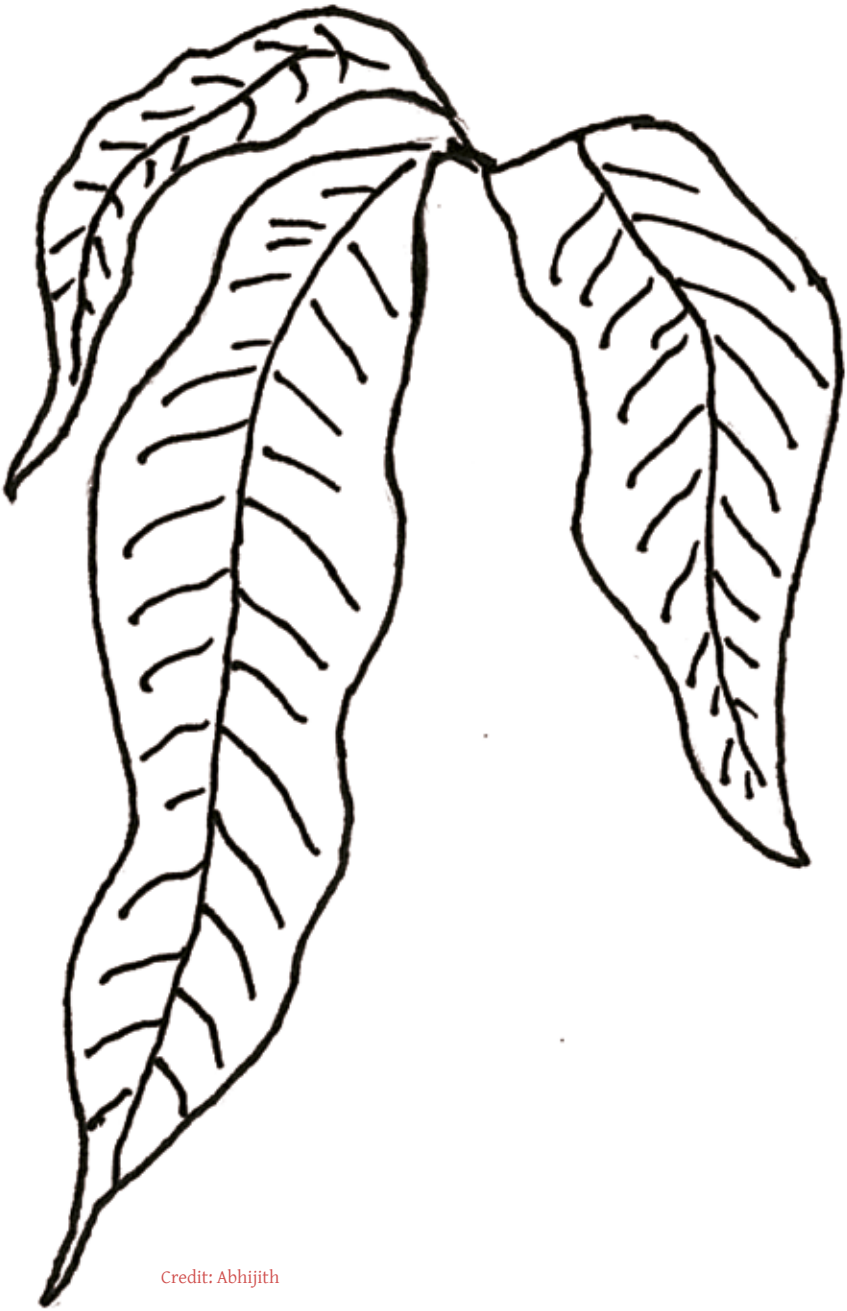
All photographs included here were taken by the students. Drawings were done by students as well, and names are mentioned against the specific drawing. However, to improve clarity, pencil drawings were traced with pen by those involved in booklet design.



Credit: Abhijith

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WHAT WE DID

An exercise done consecutively in two years may not constitute a tradition. But for us, the students of the elective "Urban sustainability in India: A social-ecological perspective", mapping and knowing about the trees in the immediate vicinity of our campus is a ritual (read assignment) we undertook just as the batch before us did.

Our campus is situated in Sompura, Anekal taluk, in the fast changing peri-urban interface of Bengaluru city. The peri-urban in Sompura is a dystopian space: at one glance we can see the newly built multi-storied apartment complexes as well as traditional houses with their tiled roofs. A hollow-block making unit, always enveloped in a grey dust, lies in the vicinity of green fields. Tarred roads criss-cross with mud paths on which morning walkers set a brisk pace while cattle saunter more leisurely.

It is in this ever-changing and dystopian landscape that we, the students from the School of Liberal Studies, were involved in an exercise to map the trees in the vicinity of our undergraduate campus. Working in groups of two, each group selected three trees of different species. We were required to identify the species, giving the scientific, common and Kannada names. We also used our phones to collect the GPS points of the trees, marking the location where each of the trees stood.

We calculated the height of the tree using a

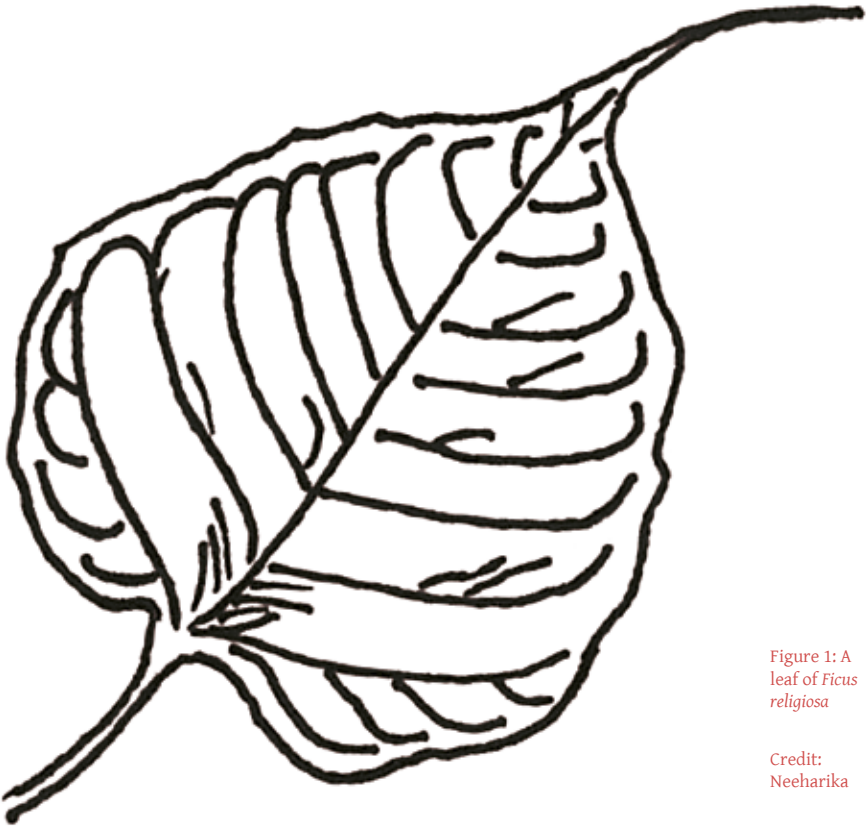


Figure 1: A leaf of *Ficus religiosa*

Credit: Neeharika

clinometer, and measured the girth in the field, and this data was used to calculate the above ground and below ground biomass, as well as the carbon stored by these trees. We also collected information on the economic, social and cultural uses of the different species, documenting the multiple everyday benefits that we all derive from the trees around us. Different parts of the trees were also photographed, and we also tried our hand at sketching various parts such as leaves, flowers, fruits, seeds and seed pods. Our botanical sketches may not be all that accurate, but represent what caught our attention.

This booklet is the collective output of our class, based on our observations, the data collected by us in the field and secondary information sourced mainly from the internet. Additionally we received a little help in correcting our calculations, and much input into design and compilation of the booklet.

WHAT WE FOUND

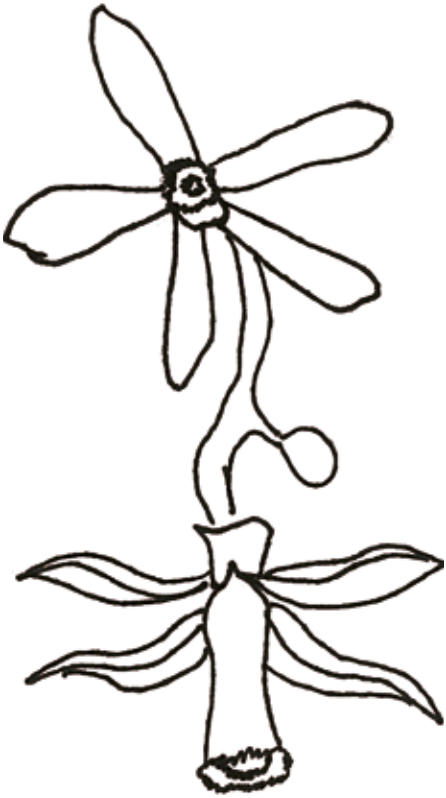


Figure 2: Flowers of *Azadirachta indica*

Credit: Abhijith

In all we mapped 30 trees of 16 species around the campus. While 13 of the species were native to India, two—the African tulip and the silver oak— were exotics and one more, the tamarind, is a naturalised species. (Yes, we learnt that tamarind is not native to India, but came from Central Africa, to become such an integral part of our lives and especially our cuisine.)

Among the native trees, the peepal, mango, jackfruit, neem, Indian beech and jamun were the common species we mapped. Pink poui and the camel-foot tree, both having flowers in pinkish hues, were the other common species. Our list for this year had a few new species, not mapped in the earlier batch, and some posed a challenge in identification.

The easier ones were the East Indian walnut, commonly known as shirish with its powder-puff stamens enclosing the flowers, and the common bur flower or kadamb tree with its fuzzy ball-shaped flowers. We had a harder time identifying the Persian lilac with its neem-like leaves and the bidi-leaf tree with the twin leaves that looked to us like other species of the genus *Bauhinia*. A *Ficus* species had us especially mystified. We circulated pictures of the tree, its trunk, leaves and dried figs, among different people familiar with fig trees. The majority identified this as the white fig (though we still hesitate to say this with absolute certainty owing to dissenting views). Our other learnings were of interest too. Trees

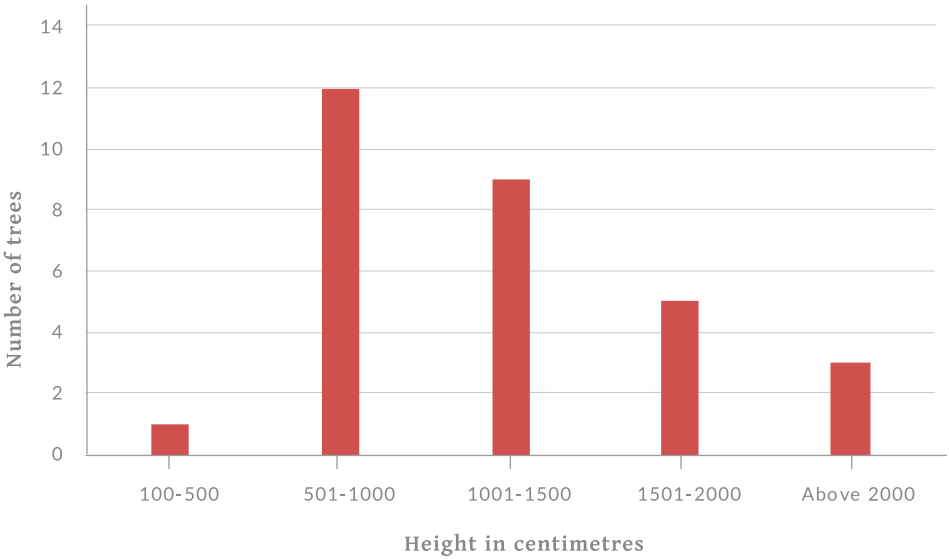
Figure 3:
Leaves of
Syzigium cumini

Credit: Sahana

require carbon to grow. They acquire this carbon by removing carbon dioxide from the atmosphere and storing it through a process known as carbon sequestration. While this is important for the growth of the tree, carbon sequestration helps mitigate global warming and climate change by reducing the amount of carbon dioxide—a main contributor to rising temperatures—in the atmosphere. In order to calculate the carbon content we had to measure the girth of the tree and the height was calculated based on the readings from the clinometer. The tallest tree (33 metres), and tree with the widest girth (9.4 metres) was a peepal. In terms of girth, the majority of trees, 18 in number were between 0.5 and 2 metres, while 21 trees were between 0.5 and 1.5 metres (See Graphs 1 and 2). The presence of such large keystone species in an urban landscape not only contributes to carbon sequestration but is also important for supporting biodiveristy of different kinds.

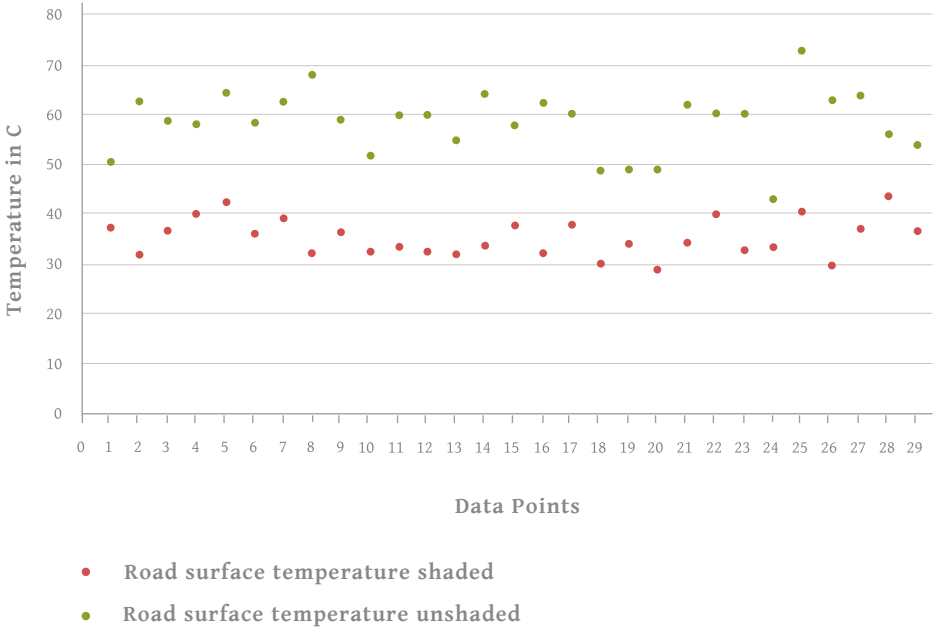
Graph 1: Distribution of trees by girth

Graph 2: Distribution of trees by height



This is not all. Trees also help to regulate the micro-climate in cities. We used infrared thermometers to measure the road surface temperature and hygro-thermometers to measure the ambient temperature under the shade of trees, and in unshaded spots close to the tree. The values of the road surface temperature were quiet stark, with the temperature difference between shaded and unshaded points ranging between 9 degrees C to as much as 36 degrees C. That is, the point (see Graph 3)on the road/path under the shade of the trees was much cooler than those that were unshaded. One of the many reasons we need trees in our cities.

Graph 3: Difference in road surface temperature between shaded and unshaded parts



MAPPED SPECIES

No	Scientific Name	Common Name	Number of Trees	Native/Exotic to India
1	*Albizia lebbeck*	East Indian walnut (shirish)	1	Native
2	*Artocarpus heterophyllus*	Jackfruit	3	Native
3	*Azadirachta indica*	Neem	4	Native
4	*Bauhinia racemosa*	Bidi-leaf tree	2	Native
5	*Bauhinia variegata*	Orchid tree	1	Native
6	*Ficus religiosa*	Peepal	2	Native
7	*Ficus virens*	White fig	1	Native
8	*Grevillea robusta*	Silver oak	1	Exotic
9	*Mangifera indica*	Mango	2	Native
10	*Melia azedarach*	Persian lilac	1	Native
11	*Millettia pinnata*	Indian beech	2	Native
12	*Neolamarckia cadamba*	Common bur flower (kadamb)	1	Native
13	*Spathodea campanulata*	African tulip	2	Exotic
14	*Syzigium cumini*	Jamun	2	Native
15	*Tabebuia rosea*	Pink poui	1	Native
16	*Tamarindus indica*	Tamarind	4	Naturalised
	Total		30	

Albizia lebbeck

Common name
East Indian walnut/Shirish

Kannada name
Baagae

The East Indian walnut is a native deciduous tree of the family *Fabacea*. The flowers are collections of yellow tufts joined together on a thin, green stem. The leaves are light green and clumped together, generally towards the end of the branch. The trunk is thin and straight, made of brown-coloured bark.

Figure 4: Flower of *Albizia lebbeck*

Credit: Anjali

Figure 5: Leaves of *Albizia lebbeck*

Credit: Maya

The wood is used for firewood, in furniture-making and in construction. Leaves are used as fodder for cattle and manure for crops. Because of the trees ability to hold the soil well, the tree prevents soil erosion.

The tree has a several uses in folk medicine. The leaves are used for antiseptic purposes. The seed oil is used for treating everything from diarrhoea to swelling to eye infections. Respiratory illnesses and skin diseases are supposed to be cured by the flower. The bark of the tree is thought to cure a variety of illnesses, from blood diseases to syphilis, to dental infections.

Artocarpus heterophyllus

Common name
Jackfruit

Kannada name
Halasu

This is a tropical evergreen tree of the *Moraceae* family. The generic name comes from the Greek words 'artos' (bread) and 'karpos' (fruit). The specific name, 'heterophyllus', is Latin for 'various leaved', or with 'leaves of different sizes and shapes'. The native range comprises of Bangladesh, India and Malaysia. Archaeological findings show that the tree has been cultivated in India and southeast Asian regions 3000 to 6000 years ago.

The tree usually reaches between 8 and 25 metres in height and the trunk branches near the base. The bark is greyish brown in colour and is rough, uneven and scaly. The trees have a long taproot, which if injured leaves all parts of the tree exuding a copious, white gummy latex. The leaves of the tree are dark green on the top and the underside is pale green. Leaves are arranged alternatively on horizontal branches, with five to 12 pairs of veins. The tree has both male and female flowers, which are cylindrical or pear-shaped.

The tree produces the largest tree-borne fruit which can weigh up to 55 kilogrammes. The oval-shaped fruit is pale green in colour.

The outer covering of the fruit bears many small spikes and it grows on the trunk of the tree. This large fruit contains a fleshy yellow portion that covers an oval shaped seed. These waxy seeds form about five percent of the entire fruit. The ripe fruit emits a strong odour that is not pleasant to many people. Each fruit consists of 100 to 500 seeds and the fruit matures during the rainy season from July to August.

Figure 6: Fruit of *Artocarpus heterophyllus*

Credit: Abhijith

Figure 7: A leaf of *Artocarpus heterophyllus*

Credit: Abhijith

The pulp of the young fruit is cooked as a vegetable, pickled or canned in brine or curry. Pulp of the ripe fruit is eaten fresh or made into various local delicacies. The seeds, rich in vitamin A, sulphur, calcium and phosphorus, are eaten after boiling or roasting, dried and salted as table nuts, or ground to make flour that is blended with wheat flour for baking. The leaves of the tree are sometimes used as a wrapping for steaming.

In India, leaves are chopped for fodder, and overripe, immature or fallen fruits are fed to hogs and cattle. The heated latex of the tree is also used as a type of cement in small objects. In India and Brazil, the latex from the tree serves as a substitute for rubber. The wood is considered superior to teak for furniture, house construction, turnery and inlay work, masts, oars, implements and musical instruments such as mridangam, veena and thimila.

Jackfruit has many medical uses. Extracts from the root are believed to help in curing asthma, diarrhoea and other illnesses. In ayurvedic medicine, the fruit is used for its antibacterial, anti-inflammatory, antidiabetic properties as well as to increase immunity, as an antioxidant, to reduce fever, and to treat constipation.

It is also an ecologically very important tree. It can be planted to control floods and soil erosion in farms. Climate change is causing failure of many crops. But this tree can survive pests and diseases, and can be a successful source of calories and nutrients for humans. It is also one of the main sources of food for many arboreal animals.

The ornate wooden plank, called Avani palakka, which is made from the wood of the jackfruit tree is used as the priest's seat in Kerala. In Vietnam, the wood of the tree is used for making Buddhist statues in temples. The heartwood is used as a dye by Buddhist monks in Southeast Asia to give the robes of the monks in their tradition the light brown colour. It is the national fruit of Bangladesh and Sri Lanka, as well as the state fruits for the Indian states of Kerala and Tamil Nadu.

Azadirachta indica

Common name
Neem

Kannada name
Bevu

Figure 8: Leaves and fruits of *Azadirachta indica*

Credit: Kezline

Neem is a fast-growing, medium-sized tree, usually attaining a height of 15 to 20 metres. It is an evergreen tree native to India. The tree has spreading branches with a trunk that is short . The bark is hard, fissured or scaly, its colours varying from whitish grey to reddish brown. The pinnate leaves have serrated margins and are purple-red when young, turning a medium green colour when mature. The tree produces small, fragrant white flowers and olive-like fruits. The fruits of the tree are small and almost completely filled with the seed. The seeds, which are viable only for a short time, are dispersed mainly by bats. The fruits are eaten fresh or cooked, or prepared as a dessert. The young branches and flowers are also consumed as vegetables.

Neem leaves are dried in India and placed in cupboards to prevent insects eating the clothes, and also in tins where rice is stored.

A particular component in the seed of the neem is also very commonly used to make pesticides.

A mixture of neem paste and water is sprayed on the plants at home to prevent insects from eating the leaves and fruits of plants. The tree's timber is used as furniture firewood and the bark oil is used in lamps. Neem seed pulp is useful for methane gas production. It is also useful as carbohydrate which is a rich base for other industrial fermentations. Neem bark contains tannins which are used in tanning and dyeing. The bark of the neem tree has fibres that can be woven into ropes.

Neem in Indian culture has been ranked higher than Kalpavriksha, the mythological wish-fulfilling tree. The medicinal properties of the neem have been well known in India for over 4000 years. The Sanskrit word for neem is 'nimba', which means good health. The Vedas call neem Sarva Roga Nivarini, which means 'one that cures all ailments and ills'. Every part of the neem tree can be used medicinally. Paste made from neem leaves is put on the skin to help treat chicken pox, measles and acne, and to soothe burns. The leaves can be steeped for malaria, peptic ulcers, and intestinal worms. The bitter, astringent bark is applied as a decoction for hemorrhoids. Neem juice (expressed from the leaves), infusion, or ointment is applied externally to ulcers, wounds, boils, and eczema. The twigs are used to clean the teeth, firming up the gums and preventing gum disease.

The seeds yield margosa oil, a non-drying oil with insecticidal and antiseptic properties which is strongly antifungal and antiviral and prevents lice and other infestations. The oil of neem leaves is used in soaps, shampoos, creams and in toothpaste. It is also used as a mosquito repellent.

Neem is considered as a useful tree in rehabilitating wastelands. Neem trees can grow in land of low fertility and under arid conditions. Neem trees help in flood control, reduced soil erosion and less salination. It is also useful in urban forestry because it has the ability to withstand air and water pollution as well as heat. Neem trees are windbreakers and provide shade. Due to this feature, many agricultural fields have neem trees. During the fruiting season, the tree attracts birds, bats and small mammals.

The flowers and leaves have a cultural value. In some houses, people hang neem leaves outside their house to ward away evil spirits. Neem flowers are traditionally used in Ugadi, the new year for south Indians, in the offerings with jaggery. Neem trees near temples are rarely cut as they are considered sacred. Neem tree is often considered to be the patron of goddess Durga in Hinduism. It is a very common sight to see temples built around a neem tree and people worshipping the tree.

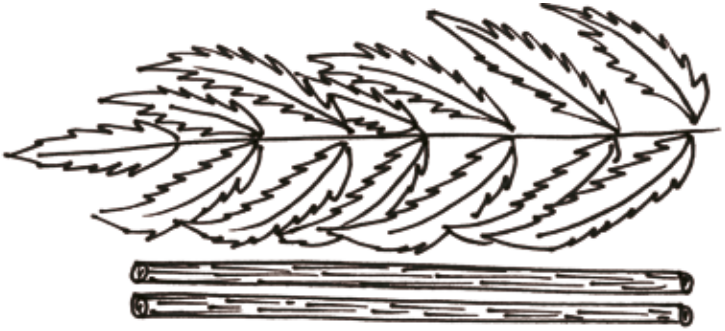


Figure 9: Leaves and sticks of *Azadirachta indica*

Credit: Sahana

Bauhinia racemosa

Common name
Bidi-leaf tree

Kannada name
Achalu

Figure 10: Leaves and flowers of *Bauhinia racemosa*

The tree is not very common in the southern region. This is a deciduous medium-sized tree with drooping branches. Leaves are light green circular-oval shaped with prominent veins showing. The leaves consist of two leaflets joined in the middle giving it the shape of a cows hoof. Leaves are broader than longer, and downy underneath. The tree has white flowers, inconspicuous, with narrow petals and hairy filaments at the base. The plant flowers during May-June with the flowers attracting honey-bees. The fruits are pods, that are thick, woody, dark and slightly curved. Each pod contains about 12 to 20 seeds. The bark of the tree has mild cracks and fissures.

The flowers are used for pickle/chutney.

The seeds, after roasting, can be eaten.

The leaves of the tree are used for making bidi's, hence the name bidi-leaf tree.

The inner bark yields a strong fibre used for cordage and its bark is used for dyeing. It also burns quite well, making it a good source of firewood.

The tree provides a good amount of shade and can also be used as a windbreaker due to its shape. It can sometimes be seen planted on roadsides in some cities.

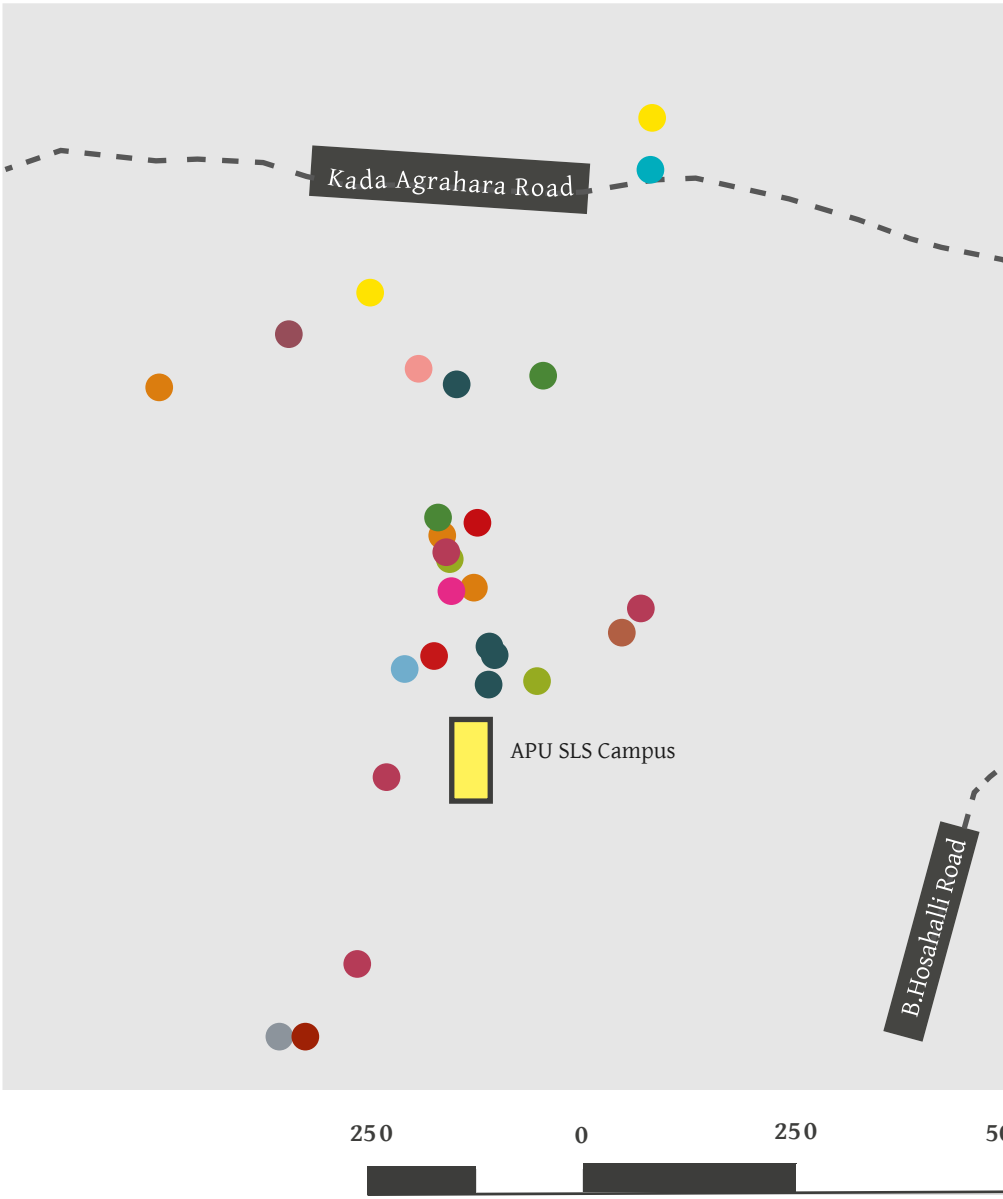
The gum and leaves are used in traditional medicine. There is evidence of the seed powder having anti-ulcer effects according to a study conducted on rats, and it also has anti-inflammatory (from methanol extracted from the bark) and anti-HIV effects. There is more research being conducted on the tree to find out its anti-asthmatic, antibacterial, antimicrobial and antiulcer effects.

Figure 11: Seeds and pods of *Bauhinia racemosa*

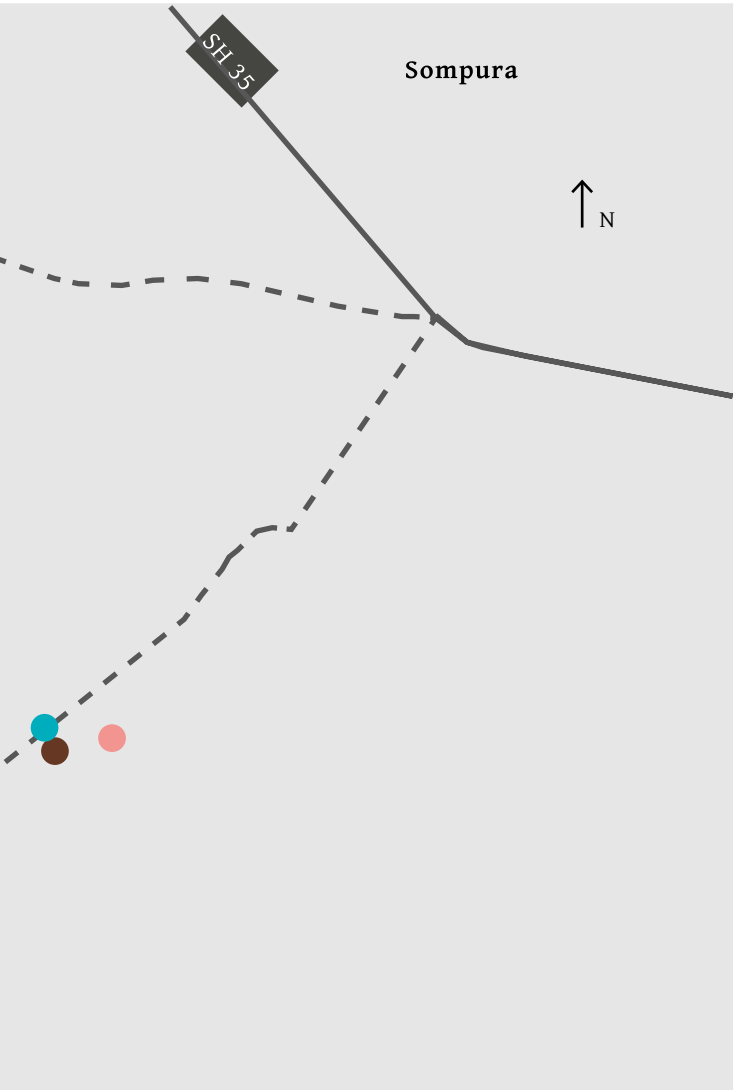
Credit: Ammu

Among Maharashtrian families, it is customary to exchange leaves of this tree, locally known as aapta, on the Hindu festival of Dussehra. This custom is known as an act of exchanging gold, showing the significance of this plant for the particular day. Due to this, the tree is sometimes referred to as Sonpatta, which literally translates to 'leaves of gold'.

LOCATION OF TREES AROUND



APU SLS CAMPUS, SOMPURA



LEGEND

- African Tulip
- Indian Beech
- Jamun
- Malabar Neem
- Neem
- Peepal
- Shirish
- Tamarind
- Bidi Leaf Tree
- Jackfruit
- Kadamba
- Mango
- Orchid
- Pink Puoi
- Silver Oak
- White Fig

00 750 1000m

Bauhinia variegata

Common name
Orchid tree

Kannada name
Kanchavala

Figure 12: Sketch of leaf and flower of *Bauhinia variegata*

Credit: Andrew

This tree on average is 10 to 12 metres in height and the leaves are round in shape like two venn diagrams intersecting.

The fruit is a pod containing seeds of the tree.

The buds are used in several Indian and Pakistani recipes.

Ficus religiosa

Common name
Peepal

Kannada name
Arali mara

Figure 13: *Ficus religiosa* with leaf and wasp

Credit: Andrew

Peepal trees are deciduous trees that are native to India. They can grow up to 30 meters in height and three meters in diameter, with branches spreading over a large area. It has unmistakable heart-shaped leaves that not only have an elongated tail like tip, that turn a beautiful purple-white shade when dry but also purple fig fruits to match when ripe. The fig fruits contain within them the flowers. This coupled with their white-ash colored flaky bark and banyan tree like extensions make them a welcome sight anywhere, especially in the urban landscape. The tree provides not only shade and fruit but also, is a vital player in the life cycle of the wasp. It has quite a beautiful relationship with its necessary pollinator partner, the wasp that in turn allows it to pollinate other plants and thrive in the ecosystem.

The fluids extracted from the heart-shaped leaves are used as ear drops. The sap extracted from within the bark has antibacterial properties, and is used in curing inflammations and swellings. Parts of the tree are also used in a traditional form of medicine for numerous disorders, some of which include asthma and diabetes.

Peepal trees have high protein concentrations and their leaves can be used as fodder for cattle. The trees also balance climatic conditions, improve soil structure, soil fertility and are also known to be good absorbers of sound. Peepal leaves show decreased amounts of chlorophyll A and B in the presence of pollutants such as sulphur dioxide and act as pollution indicators. Peepal trees can be grown in most soil types, have a high growth rate and a long life span.

Traditionally, it was under a peepal that Gautam Buddha sat in meditation at Bodh Gaya and attained enlightenment; thus it is regarded as a sacred tree (which is signified in its scientific name *Ficus religiosa*). In Hindu texts, the peepal tree is associated with the god of death, Yama, as it does not allow the growth of other plants around it and is thus known for its permanent spiritual reality, of being unrenewable and immortal

Ficus virens

Common name
White fig

Kannada name
Kari basari

Figure 14: Leaf of *Ficus virens*

Credit: Anjali

This tree belongs to the *Moraceae* family, and is a deciduous tree that can grow up to 30 metres in height. It is part of a group of fig trees called strangler figs as the seeds can germinate on other trees and slowly drain the host tree of nutrients, eventually killing the host. The bark is very smooth and is greenish white in colour. There are no aerial roots and the leaves are simple and glossy, mostly rounded but tapering to a point. The fig fruits are greenish white in colour.

The wood is used in light construction, tool making, and as fuelwood. The bark decoction is used to bathe ulcers. The vastness of the tree and its height gives it a sturdy character that holds the soil well together and makes it an excellent provider of shade.

The tree has become popular around avenues in the cities of New Delhi, and Noida due to its beautiful leaves. Massive specimens can be found inside Humayun's tomb.

Grevillea robusta

Common name
Silver oak

Figure 15: Leaves of *Grevillea robusta*

This is an evergreen species from the coasts of Australia. Felling of silver oak is prohibited in Australia as it has become a rare species, and in India it is an exotic species.

The tree has a single main bark which varies from dark grey to dark brown colour and with fern-like leaves arranged alternately. The upper surface of the leaf is smooth and hairless while the lower surface is rough and filled with ash coloured hairs. It also has showy slender yellow flowers and the flower clusters are directly attached to the plant without any intermediary branches.

The wood is popularly used for firewood and charcoal. It was also used to fuel locomotives and river steamers, power boilers and small industries. The timber of the tree is used in making railroad ties, plywood, panelling, air-freight cases and furniture, parquetry, turnery, boat building, interior trim, cabinet work, parquet flooring, boxes, toys and novelties. It is also used in making of guitars due to its tonal wood.

It is also used as windbreak and as a shade provider. The tree's gum or resin has some industrial use due to the high solubility and volatility.

It is also a preferred ornamental tree. Its' majestic height, attractive shape and beautiful foliage makes it an ideal tree for landscaping of private and public gardens. The cut leaves are used in flower arrangements, and young plants are grown as indoor pot plants in Western countries.

Mangifera indica

Common name
Mango

Kannada name
Mavina mara

Figure 16: Leaves and fruits of *Mangifera indica*

Credit: Neeharika

Mango trees are evergreen trees and are found throughout the tropical forests of eastern Asia and have been growing in India for about 4000 years. It is a long-lived large tree with broad and rounded canopy. It can grow up to 45 meters in height and has a tap root system that extends five meters deep into the soil. Leaves are lanceolate to linear, dark glossy green, with prominent light coloured veins. New leaves develop a bronze-red colour and appear wilted. They have tiny, red-yellow flowers in large terminal panicles of up to 4000 individuals. The fruit of the tree can be of different shapes, oval, round, heart-shaped and kidney-shaped and the colour can vary from red and yellow to green. The tree yields ripe fruit during the dry season (April-May) in India. The flesh of the fruits is yellow/orange in colour and astringent/fibrous. The mango is in fact a drupe with flattened, kidney shaped central stone containing one or more embryos.

Being an evergreen tree, it has a dense and wide canopy, providing shelter for a lot of animals and epiphytic plants. Mango trees are planted mainly for their commercial importance, as mangoes are an important product that is exported all over the world.

The word mango is a corruption of either the Tamil name 'mangai' or the Malayalam name 'manna' by the Portuguese sailors who brought mangoes into trade.

The mango fruit is edible and is known to be the 'king of fruits' and is used in its ripe and unripe forms in Indian cuisine. Apart from directly being consumed when it is ripe, the fruit is utilized in making chutneys to curries.

The bark of the mango tree is widely used in Ayurvedic medicines to treat hypertension, insomnia, tumour growth, rheumatism, and depression. Infusions of the leaves are used as a treatment for diabetes, high blood pressure and asthma. The seed of the fruit is antidiarrheal and an astringent and can also be used to treat scorpion stings. The flowers are aphrodisiacs and also repel mosquitoes. The bark and the leaves yield a reddish-brown dye from silk and the trees are also cut down for timber.

The cultural significance of the mango tree have found place in Ramayana, Mahabharata and the Puranas and is generally considered as a symbol of love and fertility. The trees are also planted in villages for shade and in Hindu folklore it is mentioned that Gautam Buddha rested in a mango grove. Their leaves are used for decorations for Hindu festivals. In 2018, Hindu priests burnt 50 tonnes of mango trees for a sacrifice or 'mahayagya' to the Hindu gods to reduce (ironically) air pollution!

Melia azedarach

Common name
Persian lilac

Kannada name
Turbevu

Figure 17: Leaves of *Melia azedarach*

Credit: Abhijith

This tree belongs to the *Meliaceae* family and is indigenous to India, southeast Asia and Australia. It is known for its fast growth. Leaves are tri-pinnate or bi-pinnate and are lanceolate to ovate round and crenulated, even though not as distinct as the new leaves. They have greenish fragrant flowers in large intense panicles. The fruit is ellipsoid drupe with around five seeds in them. The bark is brown, exfoliating in thin, narrow strips with broad, shallow, longitudinal cracks.

The tree is intensively used in agroforestry owing to its fast growth. The wood of this tree is used for packing cases, cigar boxes, building purposes, and agricultural implements. Apart from this, the wood is also suitable for making instruments and the fruit is also considered to be anthelmintic-drugs that expel internal parasites from the body.

Milletia pinnata

Common name
Indian beech

Kannada name
Honge

Figure 18: Pods of *Milletia pinnata*

Credit: Ammu

This is a species of the pea family which is native to countries such as India, Nepal and Bangladesh. The tree usually grows to a height of 15 to 25 metres with a large canopy. The bark of the tree is greyish brown and mostly smooth while the leaves of the tree are hairless and dark green with the veins clearly visible to the observer.

It bears pinkish flowers in the months of April, May and June generally. The tree has oval pods which are brown in colour and slightly thicker towards the centre containing one or two seeds. The long taproot of the tree makes it drought tolerant and has a dense network of lateral roots which makes it well suited for intense heat and sunlight.

Figure 19: Leaves, buds and flowers of *Milletia pinnata*

Figure 20: Pods of *Milletia pinnata*

It is largely seen to grow near waterways and is also very tolerant to saline conditions. The tree itself helps with erosion control, provides shade, and nitrogen-fixing. It is used as a soil improver and some people also plant it for ornamental purposes. The leaves are used occasionally as fodder for cattle and goats, and the seeds possess high protein but also contains toxic factors. The branches of the tree are used as firewood and the wood of the tree can also be used for making tool handle, combs, cabinets etc. While the oil and residue of the tree are toxic, the fruits and sprouts along with the seeds are used in many traditional remedies. The most important use is the oil that the tree produces which is used as a lubricant, or for varnish.

The oil also has medicinal value and is used for skin diseases, cough, reduction of the enlargement of the spleen and the seeds can be used for rheumatism. Once dried, the leaves are also used as a pesticide.

The flowers of the tree contain nectar and act as a source of pollen for the honeybees. The tree supports a lot of insect life as its flowers are host to many species of bees and beetles, that act as pollinating agents. There are also several species of host insects that lay eggs in the leaves and later these leaves are home to their larvae. The tree in some parts of India is considered sacred to Goddess Varahi, the consort of Varaha, an incarnation of Vishnu.

Neolamarckia cadamba

Common name
Common bur flower or kadamb

Kannada name
Kaduavalatige

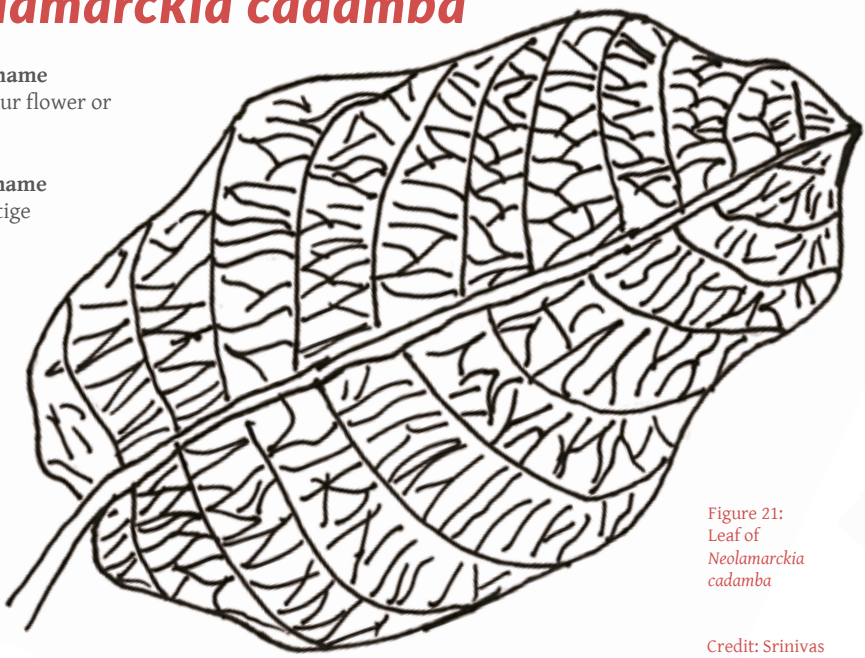


Figure 21: Leaf of *Neolamarckia cadamba*

Credit: Srinivas

This is an evergreen, tropical tree native to South and Southeast Asia. A fully mature tree can reach up to 45 metres in height. The leaves are simple and tend to range from 13 to 32 cm long. The flowers are orange, small and dense. spherical heads. The fruits are small capsules that are packed closely to form a fleshy, yellow or orange coloured infructescence that contain around 8000 seeds.

Kadamb is one of the most planted trees in the tropics, and is grown along the avenues, roadsides and villages for both shade and ornamental purposes. It is quite suitable for being used in reforestation programs. It sheds large amounts of leaf and non-leaf litter, which on decomposing boosts the physical and chemical properties of the soil.

The fruit and inflorescences are reportedly edible. It is believed to have medicinal value in curing gastrointestinal ailments and fever. Kadamb wood is used to produce low grade timber and paper. The flowers are used in the production of attar, an Indian perfume. The leaves are also used to feed cattle.

The kadamb flower was the emblem of Athmallik state, one of the princely states during the British Raj and according to Hindu mythology, it is associated with Krishna and in South India, it is known as Parvati's Tree.

Spathodea campanulata

Common name
African tulip

Kannada name
Ucchekayi mara

Figure 22: Flower of *Spathodea campanulata*

Credit: Indu

This tree is perhaps one of the most outstanding trees in the city of Bengaluru. This is because of the bright orangish-red flowers that the plant bears amidst its pinnate dark leaves. The buds that bear these flowers are essentially pods filled with a watery sap. The tree has flowers which are almost bell shaped, orange and yellow in colour, and leaves that are oval shaped. It has a sturdy bark with a rough trunk.

The timber in particular being soft wood is used to make paper and drums. Being a tree that has been native to Africa, it was introduced to India around the beginning of 1900s and since then it has been used as an ornamental plant.

The flowers attract various species of insects and birds from sunbirds to mynahs because of the sweet rewards offered by the tree. It is used in reforestation, soil improvement and as a fencing.

Apart from its ecological significance the plant is also used in the field of medicine to make medication for malaria, HIV, dysentery, etc.

Syzigium cumini

Common name
Jamun

Kannada name
Nerale

Figure 23: Fruit and leaves of *Syzigium cumini*

Credit: Neeharika

This is an indigenous tree of India that thrives in arid conditions, such as the dry deciduous forests of South India. The fruit resemble the shape of small marbles, round with a slight oval characteristic, often black when ripened. The fresh leaves are a light green and have a smooth polished outer surface. The leaves on the stems of the branches droop down. The leaves when crushed give off a mild sweet smell.

The leaves have high nutritional value and are used as fodder for cattle, especially during the dry seasons. The tree trunks are used as timber for buildings, for railway sleepers and for agricultural equipment. This is because of the wood's resistance to water. Timber is also used to make furniture such as door frames and cartwheels, however given that the grain composition is very dense, it is rather difficult to work with. The tree is economically important and farmers can expect to earn profits by selling it.

The tree is planted alongside agricultural fields and roads to act as a windbreaker. Jamun trees are hardy and grow well in semi-arid and tropical conditions. The tree provides a habitat for many birds and animals. It also provides them with fruits and seeds and its flowers are used abundantly for honey. It also provides ample shade and helps to cool the area under it.

The tree is used in Ayurveda, Unani and in Chinese medicine. The fruits of the jamun tree have several medical benefits. Apart from being a tasty fruit, jamun helps in controlling blood sugar levels in diabetic patients, as a blood purifier, for curing digestive disorders and kidney stones. It is also good for the eyes and the skin. Wine and vinegar is made from the fruit and it is rich in vitamin A and C.

The leathery fruit holds a firm place in Indian mythology. Called the fruit of the gods, it is said that Lord Ram lived on the jamun for years after his exile from Ayodhya. His skin is often compared to the slick texture of the fruit, and temples constructed in his honour will always house at least one jamun tree. Lord Megha, the God of the Clouds, is said to have descended onto Earth in the form of a jamun, which is why the colour of the fruit is as dark and stormy as the fierce monsoon clouds. The ancient Puranas narrate the splitting of the cosmos into seven concentric island continents, at the centre of which was the Jambudvīpa, literally translating to 'the land of the Jambu trees'. The Vishnupurana states that this is the world on which we are and it got its name from the tree that stood at its centre. This tree was said to bear jamun fruit as large as elephants, which, when they fell, burst with juices that flowed out.

Tabebuia rosea

Common name
Pink poui

The tree has a long, smooth trunk topped by a rounded spreading crown. It has a spectacular bloom of showy, trumpet-shaped, purplish-pink to white flowers (2-4 inches long) with yellow throats which bloom in clusters. Flowers are followed by bean-like pods (8-12 inches long). Each palmate leaf has five, leathery, scaly, elliptic to elliptic-oblong, toothless, medium to dark green leaflets (central one to 12 inches long) with undulate margins.

Preparations of the bark of the tree are consumed to eliminate intestinal parasites and to treat malaria and uterine cancer.

A decoction of the bark is recommended for anaemia and constipation. A decoction of the flowers, leaves and roots has been used to reduce fevers and pain, cause sweating, to treat tonsil inflammation and various other disorders.

This flowering tree is commonly planted as a lawn specimen, to decorate parks, gardens, houses, etc. It is also useful as a shade tree on the streets.

Tamarindus indica

Common name
Tamarind

Kannada name
Hunise mara

Figure 24: Leaves and fruits of *Tamarindus indica*

Credit: Sahana

The tamarind is a strong, sturdy evergreen tree that provides a cooling shade for anything that needs growing under it or even the occasional passer-by in search of some quiet and cooling time amidst nature. The tree can grow up to 25 metres, with a stout trunk with thick bark. It is characterized by a dark grey bark and leaves arranged in the form of small, oblong leaflets.

The tree bears small yellowish flowers with red veins on them, and dark brown pods that contain seeds. The trees are known for their robustness and their deep roots firmly bind the soil together. Despite being an exotic species, the tamarind has not been invasive and has instead integrated itself well into the Indian context.

Tamarind trees are best known for their fruits. Once the shell is opened, the brown sticky and sour pulp can be used to make a variety of dishes across South Asia. It is also a valuable timber species. The tree supports many species of bees and beetles that serve as pollinators and it helps in nitrogen fixation of the soil, thereby improving soil quality.

The ripe fruit, leaves, roots and seeds are well recognized for their medicinal properties. The fruit is said to cure fever and is used as a mild laxative. The seeds have been traditionally used to cure diabetes and intestinal ailments. Tamarind paste mixed with water is a good remedy for curing sore throats. It is also used to treat insect bites and stings as the tamarind paste acts as an antidote. Tamarind is also used in the form of a paste to reduce swellings and aches in joints.

There are many references to the tamarind tree in Hindu mythology. Some legends connect the tree to Usha, the daughter of Goddess Parvati. In a Hindu myth, Usha, the daughter of Parvati, supposedly says that salt cannot be taken during the month of Chaitra, and that food must be instead seasoned with tamarind pulp. In South India, the tree is associated with night spirits and is generally grown in the precincts of the temples dedicated to Devi, who is believed to battle the evil spirits during night. The tree is associated with Lord Krishna in the northern parts of the country. 'Imli-tala' is a sacred tamarind tree located in Vrindavan, Uttar Pradesh. It is believed to date back to Lord Krishna's time.

Figure 25: Fruits of *Tamarindus indica*

Legend has it that the tree was cursed by Radha. The story is that, one day when she was walking to meet Krishna, she stepped on the thick bark of a ripe tamarind fruit and it cut her foot. This made her late for her meeting with Lord Krishna. She therefore cursed the tree that its fruits would never ripen. Even today, the fruits of this tree fall down before getting fully ripened. The 15th century saint Sri Chaitanya Mahaprabhu would also sit under the Imli-tala and meditate upon Lord Krishna. Legends also associate the tree with Lord Rama. It is believed that the tamarind leaf was split by an arrow shot by Lakshmana, brother of Lord Rama.

The seeds from the tamarind fruit are used to play the game pallanguzhi (in Tamil).

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