

***Adansonia digitata* (Goraksi/Goraknath vriksha): An exotic, longest lived and largest tree species in the world**

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Introduction

Adansonia digitata is regarded as the “largest succulent plant in the world”, belongs to the family Malvaceae (Sub family: Bombacaceae). This species is commonly called as Baobab tree, Monkey-bread tree, Upside-down tree. In hindi it is called as Goraksi, Gorak ali, Gorak amla and in kannada locally it is called as Nimbe gida or Dodda Hunase Mara. The baobab tree is steeped in a wealth of mystique, legend and superstition wherever it occurs in Africa. It is a tree that can provide food, water, shelter and relief from sickness. The spongy acid pulp has been used as a substitute for Parmesan cheese on pasta - no cholesterol. Facetiously it is called as "Dead Rat Tree" because its furry fruits resemble rats strung up by their tails. This is one of the longest lived and largest trees in the world - so large that they have been used as jails in Africa. This tree has beautiful creamy white flowers that hang down and are pollinated by bats. It is also known as the "TREE of LIFE" popularized by Disney in the Lion King and their new amusement park.

Derivation of name and historical aspects

The name *Adansonia* was given to this tree to commemorate the French surgeon *Michel Adanson* (1727-1806); the species name *digitata* meaning hand-like, is in reference to the shape of the leaves. A number of significantly large, historical baobab trees can be seen in the Limpopo Province;

- The Sagole Baobab is biggest tree in South Africa (East of Tshipise) with a stem diameter of 10.47 m, a height of 22 m and a crown spread of 38.2 m.
- The Glencoe Baobab near Hoedspruit is probably the second largest tree with a stem diameter of 15.9 m, a height of 17 m and a crown spread of 37.05 m.
- The Platland Baobab that grows near Duiwelskloof, today houses a pub. It has a stem diameter of 10.64 m, a height of 19 m, and a crown spread of 30.2 m.

- The Buffesldrift Baobab which is in the Makopane District has a distinct trunk with a diameter of 7.71 m, a height of 22 m and a crown spread of 30.2 m.

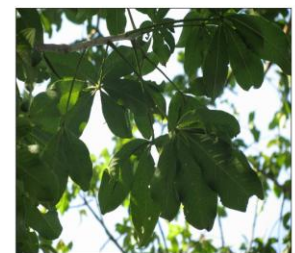
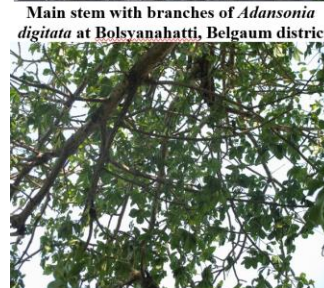


Fig. 1. *Adansonia digitata* at Bolsyanahatti, Belgaum district

Ecology and distribution

History of cultivation

Although the tree is not native to **Egypt**, the fruit was known in the herb and spice markets of **Cairo as early as 2500 BC**. It was known as ‘**bu hobab**’, probably derived from the Arabic words ‘**bu hibab**’, which means ‘**fruit with many seeds**’. **M. Adanson** introduced the baobab tree into Europe during the middle of the 18th century. The baobab was declared a protected tree under the Forest Act in South Africa in 1941.

Natural Habitat

The tree is characteristic of thorn woodlands of the African savannahs, which are characterized by low altitudes with 4-10 dry months a year split into 1 or 2 periods. *A. digitata* is resistant to fire, termite and drought, and prefers a high water table. It occurs as isolated individuals or grouped in clumps irrespective of soil type. It is not found in areas of deep sand,

presumably because it is unable to obtain sufficient anchorage and moisture. *A. digitata* is very sensitive to water-logging and frost.



Fig. 2. *Adansonia digitata* trees at Savanur, Haveri district

Geographic distribution

The baobab tree is found in areas of South Africa, Botswana, Namibia, Mozambique and other tropical African countries where suitable habitat occurs. It is restricted to hot, dry woodland on stoney, well drained soils, in frost-free areas that receive low rainfall. In South Africa it is found only in the warm parts of the Limpopo Province. It may however be cultivated in areas of higher rainfall provided they are frost free and don't experience cold winters.

Goraksi is not indigenous to India, but supposed to have been introduced from Africa by Arabian traders. It is one of the most beneficial, but less commonly utilized plants in the treatment of amlapitta (hyperacidity). Goraksi grows throughout India, especially, in north India, Bihar, Madras, Bombay and Karnataka.

In Karnataka

In Karnataka state this species is distributed only in few districts. It is found in Belgaum, Bijapur and Haveri districts. In Belgaum it is found in Nidsosi (one tree) Bolsyanahatti (one tree) and Ramadurga (one tree). In Haveri this species is found in the town of Savanur thaluk (Three trees).

Belgaum District

- ❖ **Nidsosi:** Hukkeri (tq) (One tree) Height: 8-10 m and Girth: 12.5 m
- ❖ **Narasingapur, Bolsyanahatti :** Height: 22 m and Girth 12.05 m
- ❖ **Katakol, Ramadurga (Tq)** Height: 22 m, Girth: 11.80 m , Clear bole 5.20 m

Bijapur District

- ❖ **Bijapur:** Three trees (one died)

Haveri District

- ❖ **Savanur** (Three trees): recently one tree damaged and later rejuvenated with the help of local people, Karnataka Forest Department and University of Agricultural Sciences, Dharwad.

Habitat factors

Altitude: 0-1500 m

Mean annual rainfall: (100)250-1000(1500) mm.

Soil type: Shows a preference for well-drained soils that are acidic (pH <6.5), preferably with sandy top soils overlaying loamy substrates.



Fig. 3. Flower and fruits on trees

Botanical description

Adansonia digitata is a large, round canopied tree with a swollen trunk; about 10-25 m in height, often with a bole of 3-10 m. The main stem of larger baobab trees may reach enormous proportions of up to 28 m in girth. Bark is soft, smooth, fibrous, reddish-brown, greyish-brown or purplish-grey with 50-100 mm thick. Leaves alternate, digitately 3 to 9 foliate; leaflets oblong to ovate, 5-15 x 3-7 cm in size, petiolules absent or almost so; petiole up to 12 cm long. Flowers are waxy white, scented up to 20 cm in diameter, bisexual; all floral parts in 5s. The fruit is a large, ovoid or egg-shaped capsule (often >120 mm in size), covered with a yellowish brown hairs, indehiscent.

Seeds hard, smooth, black, kidney-shaped, embedded in a whitish powdery pulp, have little or no endosperm.

Phenology

Being deciduous, the leaves are dropped during the winter months (December –January) and appear again in late spring or early summer (March-May). Flowering occurs from October to December. Fruiting occurs during April – May. Seeds are probably orthodox; no loss in viability during 1 year of hermetic storage at 4°C; viability can be maintained for several years in hermetic storage at 30°C with 8-11% moisture content. There are normally 2000-3000 seeds/kg.

Propagation and management

Propagation methods

One of the most common ways of natural regeneration is when the fruits fall off the tree and crack. Ants enter the fruit and feed on the pulp. In this way, soil is introduced into the fruit and it becomes moist with the onset of the rains, thereby allowing germination to take place.

Artificial propagation is by direct sowing of the seed. Pretreatment is not necessary. However, germination is more successful if the seeds are nicked or boiling water is poured on them, after which they are left to soak for 24 hours. Soaking in water overnight softens the seed coat and makes water absorption for germination easy. When the seed coat is nicked it may take only 6 days to germinate. Germination is usually 90-100% and takes 1-3 months. It is preferable to sow the seed directly into the soil or straight into polythene tubes. Seedlings should be carefully monitored for damping off fungus, which can be treated with a fungicidal drench. It is advisable to prune the roots only twice before planting out. Transplant the seedlings once they are 50 mm high into individual containers, preferably in a sandy soil with some well-rotted compost and bone meal. Baobabs grow reasonably quickly when they are young.

Tree Management

Once established, the seedlings grow well, becoming 2 m tall in 2 years, and 7 m tall in 10 years. The tree then grows slowly but lives long; under favourable conditions some *A. digitata* may live for more than 1000 years. There is a prehistoric drawing

of an *A. digitata* tree at the National Museums of Kenya. *A. digitata* may be pollarded or lopped to encourage abundance of leaves.

Pests and diseases

The tree is very much liked by elephants, which cut the storage tissue of the bole and can damage or even destroy a tree. Insects such as Cotton bollworms, Cotton stainer bugs and flea beetles affect the growth of trees. Long-horn beetle, *Anelopes trifasciata*, attacks and kills young trees by girdling the stem. The *sooty baobab syndrome* is an episodic, drought-induced phenomenon related to climatic changes, made worse in recent times by human interference that limits local availability of soil moisture. Affected trees, which appear dead or dying exhibit a striking, blackened or burnt appearance, hence the colloquial term '*sooty baobabs*'.

Valuable uses and services rendered by the species

- ❖ Fruit is very rich in vitamin C and B₂ and makes a refreshing drink. Young leaves are also rich in Vitamin C, contain uronic acids, and are high in demand as a soup vegetable. The small stem and roots of the seedlings are eaten as vegetable; mature, thick roots are cooked and eaten during famine. Having high water content, the wood is chewed by humans and animals in case of extreme water scarcity. The seeds contain appreciable quantities of tartaric acid and potassium bitar; they are refreshing to suck, and when soaked in water make a palatable drink. Seeds are used as a substitute for cooking oil.
- ❖ Young leaves, fruit, pods and seeds provide fodder for game and domestic animals. The tree is a source of fine quality honey. Wild bees manage to perforate the soft wood and lodge their honey in the holes.
- ❖ The long-fibred wood is suitable for firewood. The shell and seeds are also used for fuel. The bark from the lower part of the stem of younger trees and of the roots can be removed to produce a valuable fibre. It is used to make excellent cordage, ropes, harness straps, mats, snares and fishing lines, fibre cloth, musical instrument strings, tethers, bed-springs and bow strings. Strong, tough and tear-resistant paper is produced from the fibre. It is

commercially exploited in India for currency notes.

- ❖ The wood is whitish, spongy and light (air-dried 320 kg/cubic m). It is used for making canoes, rafts, insulating boards, wooden platters and trays, boxes and floats for fishing nets. The wood contains some tannin, and the acid pith is used to coagulate rubber. The roots produce a useful red dye.
- ❖ The bark is boiled for days to extract a substance poisonous to ants. Fruit pulp burns with an acrid, irritating smoke that can be used to deter insects troublesome to livestock.
- ❖ **Medicinal uses:** Hyposensitive and antihistamine properties are present in the leaves, which are used to treat kidney and bladder diseases, asthma. Leaf and flower infusions are valued for respiratory problems, digestive disorders and eye inflammation. The seed paste is used for curing tooth and gum diseases. Gum from the bark is used for cleansing sores. The bark is used in steam baths for calming shivering and high fever. A decoction of the roots is taken as a remedy for lassitude impotence and kwashiorkor. The bark is boiled and taken as a cure for body pains. Seeds are used to cure gastric, kidney and joint diseases.

- ❖ Ash from the shell, bark and seed, rich in potash, is widely used in making soap. The seed shell also makes an excellent rat trap.
- ❖ **Soil improver:** Decaying wood of a tree that has died of old age or from lightning is spread on fields as a fertilizer. Ashes from the shell, bark and seed are rich in potash and are useful as a fertilizer.
- ❖ **Ornamental:** *A. digitata* is a popular species for bonsai specimens.
- ❖ **Other services:** In dry regions, *A. digitata* plays a vital role in water storage; a hollowed trunk may be carved out in 3-4 days. A medium-sized tree may hold 400 gallons while a large tree could contain over 2000 gallons, and water stored in them is said to remain sweet for several years if the hollow is kept well closed.
- ❖ **Cultural values:** In some parts, the baobab is worshipped as a symbol of fertility. It is a belief among certain people that spirits inhabit the flowers of the baobab and that any person who picks a flower will be eaten by a lion. It is also believed that water in which the seeds have been soaked will offer protection against attack by crocodile, while sucking or eating the seeds may attract crocodiles. It is also believed that a man who drinks an infusion of the bark will become strong.
