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Plantations Of Baobab Tree (*Adansonia species*) And Its Health Bebefits In Agriculture

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ABSTRACT
Baobab and other tropical trees in Nigeria are under exploited and facing the threat of extinction due to intense and unrelenting deforestation resulting from greater demand for land and urban development, farming and firewood especially among rural dwellers. The vast potentials of this significant tree species were highlighted in this article such as scientific classification, species, distribution, uses, constituents and its application in the pharmaceutical and vegetable industry. Furthermore baobab is rich in oil, vitamin C, calcium, tartaric acid, potassium, gums, mucilage, tannins and alkaloids (adansonnine). It is also used as a remedy for fever and dysentery, small pox and as an anti perspirant and antioxidant as well as the healing of wounds in circumcision. This article further recommended that; an intensification of research into the immense untapped potentials of this tree is desirable, in situ and ex situ conservation practices are required, collection and preservation of this relevant germplasm and stringent implementation of legislative provisions against deforestation and bush burning in restoring this valuable plant species from extension are needed.
Keywords: *Adansonia* species, scientific classification, species, distribution, uses, constituents and application.

INTRODUCTION

The botanical name of baobab tree is *Adansonia species.* The common names of *Adansonia* include; baobab tree, Monkey bread tree, Upside-down tree and Cream of tartar tree. The local names include; Hausa (Kuka), Yoruba (Oshe), Ngizim (Waka kuku) and Bini (Usi) (Sharrif, 2016 & Adamu, 2017). All trees in the genus *Adansonia* belong to the kingdom plantae. They are motile multi-cellular organisms that have cell wall or chloroplast (Michael, 2012). The author equally ascertained that *Adansonia species* are flowering plants and they produce their own food through a process called photosynthesis.

Scientific Classification of Baobab Tree (A*dansonia species*)

Binomial nomenclature refers to two naming system that include genus and species name. Therefore, genus refers to group of plants of similar species while specie is a smallest unit of classification in plant kingdom (Michael, 2012). However, the scientific classification of *Adansonia species* is shown below:

Kingdom: plantae
Phylum: Angiosperms
Sub-phylum: Eudicots
Class: Rosids
Order: Malvales
Family: Malvaceae
Sub-family: Bombacoideae
Genus: Adansonia

Source: (Pettigrew, 2012, Gardner, Pindar & Lai, 2011).

Species of Baobab Tree (*Adansonia species*)

Pettigrew (2012), Gardner, Pindar & Lai (2011) and Germplasm Resource Information Network (GRIN, 2011), adduced that the nine species of tree in the genus *Adansonia* include the following:

1. *Adansonia digitata L.*
2. *Adansonia grandidieri Bail*
3. *Adansonia gregorii F. Muell*
4. *Adansonia kilima Pettigrew*
5. *Adansonia madagascariensis*
6. *Adansonia perrieri Capuron*
7. *Adansonia rubrostipa Jun & H. Perrier*
8. *Adansonia suarezensis H. Perrier*
9. *Adansonia za Baill-za*

Distribution of Baobab Tree (*Adansonia species*)

Baobab is a common name for each of the nine species of tree in the genus *Adansonia*. The generic name honors Michel Adanson, the French naturalist and explorer who described *Adansonia digitata*. However, of the nine (9) species, six (6) are native to Madagascar, two (2) are native to mainland Africa and the Arabian Penisulla, and one is native to Australia. One of the mainland African species also occurs on Madagascar, but it is not a native of that island. It was introduced in Ancient times to South Asia and during the colonial era to the Caribbean. It is also present on the Cape Verde Island (CVI). The Ninth specie was described in the year 2012. This specie is found in upland populations of Southern and Eastern Africa respectively (Wickens & Lowe, 2008). The African and Australian baobabs are almost identical, having separated less than 100,000 years ago (Pettigrew, 2012).

Baobabs reach heights of 5 to 30 m (16 to 98ft) and have trunk diameters of 7 to 11 m (23 to 36ft) (Baum, Small & Wendel, 1998). The Glencoe baobab is a specimen of *Adansonia digitata* in Limpopo province, South Africa. This was considered to be the largest living *Adansonia*, with a maximum circumference of 47 m (154ft) and diameter of about 15.9m (52ft). The tree has since split into two parts, so the widest individual trunk may now be that of the Sunland baobab or flatland tree at ground level is 9.3m (31ft) and it is circumference at breast height is 34m (112ft) (Patrut, 2010).

Adansonia trees produce faint growth rings, probably annually, but they are not reliable for aging specimens, because they are difficult to count and may fade away as the wood ages Royal Botanical Gardens (RBG, 2014). However, the record of radiocarbon dating has

provided data on few *Adansonia species.* A specimen of *Adansonia digitata* known as *Grootboom* was dated and found to be atleasts1275 years old, making it to be one of the oldest angiosperm trees in the world (GRIN, 2008 & GRIN, 2011).
Baobab is a drought resistant tree because it store water in the trunk (up to 100,000 litres or 26,000 US gallons) to endure the harsh drought conditions particularly to each region (GRIN, 2008). All *Adansonia species* occur in seasonally arid areas, and they are deciduous, shedding their leaves during the dry season (GRIN, 2011). Shariff (2017) opined that *Adansonia is* a mastic tree which is native of Africa. It was named "the small pharmacy or chemist tree" because it is parts are used as food or medicine. They are trees of savannah, which can live up to one thousand years or more. They have indehiscent fruit, which are large, egg shaped capsules. They are filled with pulp that dries and hardens into hard block and becomes kidney shaped. The trees are usually found in Maritimes, Senegal, Togo, Benin, Gambia, Sudan, Congo, Tanzania and Angola respectively.

Uses of Various Parts of Baobab Tree (*Adansonia species*)
The various parts of *Adansonia species* used include; leaves, fruits, pulp, bark and roots (Shariff, 2017). Since 2008, interest has been increasing for developing baobab seeds or direct fruit powder for consumer products (Hills & Sarah, 2008). However, the significance of the various parts of *Adansonia* includes;
1. Leaves of *Adansonia digitata* are eaten as vegetables.
2. Seeds are valuable source of vegetable oil.
3. Fresh fruits provide acidic, tartar flavor and it is between grape fruits, pear and vanilla.
4. Dried fruits provide taste like sherbet.
5. Bark provides valuable alkaloids.
6. Roots provide medicinal properties.
7. Pulp is used for making drinks.

Since 2008, interest has been increasing for developing baobab seeds or dried fruit powder for consumer products (Hills & Sarah, 2008). Leaves of *Adansonia digitata* are eaten as vegetables. Seeds are source of vegetable oil. Fresh fruit has an acidic, tartar flavor and its somewhere between grape fruits, pear and vanilla. Dried baobab fruit taste like sherbet (Sidibe, 2002 & United Kingdom Advisory Committee on Novel Food Processes (UKACNFP, 2008).
In the European Union (EU), prior to commercial approval, baobab fruit powder was not available for ingredient uses as legislation from 1997 dictated that food not commonly consumed in the EU would have to be formerly approved first. In 2008, baobab dried fruits pulp was authorized in the EU as a save food ingredient and it was later granted GRAS in the United States (US) (GRIN, 2008).

Constituents of Baobab Tree (*Adansonia species*)
Shariff (2014), adduced that the following are some chemical constituents of baobab tree:
1. **Pulp contents**

The pulp contains 0.3% vitamin C, calcium 2.7%, tartaric acid 2%, potassium 12%, gums, mucilage and tannins.
2. **Bark contents**

The bark of *Adansonia* species contains alkaloids (Adansonnine).

3. **Leaves contents**

The leaves contains vitamin C, *catechins*, uronic acids and sugar, 50% more calcium than spinach, high in antioxidant, has vitamin C three times of orange.

4. **Fruit contents**

The fruit is used in smoothies.

5. **Seed contents**

The seed contains phosphorus, magnesium, zinc, iron, manganese and calcium.

Health Benefits of Baobab Tree (*Adansonia species*)

In another development, Shariff (2014) ascertained that the following are some medicinal/health benefits of *Adansonia species*:

1. Oil is extracted from the seeds.
2. Baobab milk is richer in protein, calcium and iron than human milk (used in infant feeding).
3. Fresh leaves/dried are used in soap making. The soap is used in Ghana for weaning children.
4. Fruit pulp is made into drink as remedy for fever and dysentery.
5. Leaves are used as remedy for small pox, measles and amenorrhea, antiperspirant and healing wounds in circumcision.
6. Bark is used as an ant malarial.
7. Leaves have hypotensive and antihistaminic properties.
8. Seed is a good source of phosphorus, calcium and manganese.

Health Benefits of Baobab Tree (*Adansonia species*)

From the medical perspective, drugs dosage and administration is one of the constraints of using traditional medicine. However, effort has been made possible in tracing the recommended dosage when using various parts of *Adansonia species*. In line with the above assertion, Shariff (2014), provided the following dosage:

1. One to two (1 – 2) table spoonful of powdered pulp in glass of water, add lemon and sugar for extra benefits as refreshing drink.
2. Pulp when mixed with honey, ginger and cloves. 2 table spoonful of pulp powder = 1 tea spoonful of ginger + 1 tea spoonful of clove in tea cup of honey is suitable mixture, taking 3 - 4 times daily for cold, asthmatic cough.
3. A solution of pulp can be applied to skin infections and taken as source of vitamin C to facilitate healing.
4. Poultice of young leaves is applied to rheumatic joints and swellings to relieve pain.
5. Pulp leaves mixed with milk or yoghurt improves the quality of semen.
6. Pulp in water is an energy booster, suitable for children.
7. Decoctions of the bark is a remedy for itching and boils.
8. Taking the leaves in soups is good for pills.
9. Combination of carrots (*Daucus carota*) and baobabs is a good nutritious drink for children.

CONCLUSION

Baobab which is also referred to as 'Africa's tree of life' is under the threat of going into extinction due to intense and unrelenting deforestation resulting from greater demand for land for urban development, farming and as well as for fuel especially among rural dwellers. These activities are destroying valuable germplasm. Local efforts towards the conservation of the tree are dismal and research into its potentials inadequate. Superstitious belief in some communities is affecting its cultivation and conservation. These issues and others have to be urgently addressed if this green gold is not to be lost forever.

RECOMMENDATIONS

Based on this article, the following recommendations were made:

1. Collection and preservation of germplasm especially in research and educational institutions should be intensified.
2. In situ and ex situ conservative measures should be put into place to prevent the loss of germplasm.
3. Awareness campaign at the three tiers of government should be embarked upon to make people particularly rural dwellers to appreciate the significance of this plant especially its health benefits as well as to correct misconceptions about the plant.
4. Baobab tree and other neglected tropical trees should be properly reflected in the curriculum of agriculture.
5. Entrepreneurs particularly those in the food industry should be encouraged to use baobab as raw materials in the production of assorted goods due to its health benefits.
6. Local consumption of locally manufactured products should also be encouraged by reducing media air time and public space for the promotion of foreign goods.
7. More intensive research into the plant should be encouraged by both the public and private sectors of the society through the provision of grants.
8. Strict implementation of legislative provisions against bush burning and deforestation which should go hand-in-hand with poverty alleviation programmes so as to curb the desire and need among rural dwellers to fell trees for fuel.
9. Modern technologies of farming should be encouraged which can provide far greater yields with less use of land.

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