

# The Health Properties of Baobab (*Adansonia Digitata*)



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# BAOBAB (*Adansonia Digitata L*)

FAMILY: *Bombacaceae*

GENUS: *Adansonia L.*

SPECIES: *Adansonia Digitata Lin*

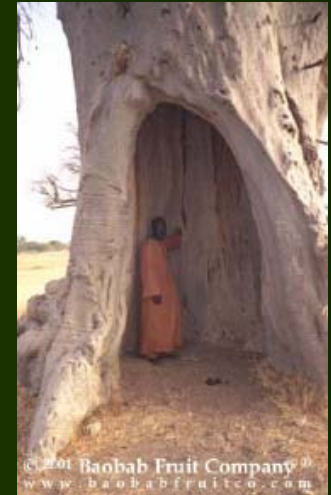
SYMBOL OF AFRICA ALSO KNOWN:

“MAGIC TREE”

“CHEMIST TREE”

“SYMBOL OF THE EARTH”

“THE TOP-DOWN TREE”



**PARTS OF THE BAOBAB TREE EMPLOYED:**

**FRUIT**  
**LEAVES**  
**SEEDS**  
**BARK**



# NATURALLY DRIED FRUIT PULP



The baobab fruit pulp is spontaneously dried, a unique characteristic.

It is a non processed product, just a mechanical separation of the powder is needed!

**A REALLY NATURAL PRODUCT...**

# NUTRITIONAL VALUES OF BAOBAB FRUIT PULP

## NUTRITIONAL INFORMATION

	Average on 100 g. of pulp		% RDA*	RDA *
Energetic Value	131 Kcal/555 KJ			
Protein	5,3 g.			
Carbohydrates	30 g.			
Fat	0,15 g.			
Alimentar Fiber	48 g.			
Sodium	0,002 g.			
Vitamin A	200 mcg.		25 %	800 mcg.
Vitamin C	300 mg.		500 %	60 mg.
Thiamine (B1)	0,48 mg.		34 %	1,4 mg.
Riboflavine (B2)	0,28 mg.		17 %	1,6 mg.
Niacine (PP)	3 mg.		17 %	18 mg.
Vitamin B6	2,13 mg.		106 %	2 mg.
Calcium	265 mg.		33 %	800 mg.
Phosphorus	210 mg.		26 %	800 mg.
Iron	7 mg.		50 %	14 mg.

RDA\*: recommended daily dose

## AMMINOACIDS CONC. on g/100g Protein

Proline (PRO)	2,35 g/100 g
Histidine (HIS)	2,71 g/100 g
Leucine (LEU)	8,41 mg/100 g
Lysine (LIS)	14,62 g/100 g
Arginine (ARG)	6,04 g/100 g
Isoleucine (ILE)	10,73 g/100 g
Methionine (MET)	4,92 g/100 g
Cystine (CYS)	11,23 g/100 g
Phenilalanine (PHE)	4,11 g/100 g
Glutamic Acid (GLU)	4,02 g/100 g
Valine (VAL)	1,62 g/100 g
Tyrosine (TYR)	4,21 g/100 g
Tryptophan (TRP)	1,49 g/100 g
Threonine (THR)	2,96 g/100 g

# HEALTH BENEFITS

- Antioxidant
- Source of soluble fibers with PREBIOTIC-LIKE activity *in vitro*.
- Anti-inflammatory, analgesic, antipyretic activity
- Anti-diarrhoea, anti-dysentery activity, anti-costipation
- Source of micronutrients
- Natural and interesting excipient

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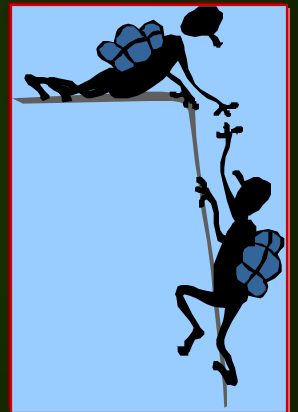
# Free radical oxidative stress is implicated in the pathogenesis of a variety of human diseases

- Intestinal diseases
- Atherosclerosis
- Reumatic disorders
- Reperfusion injuries
- Neurodegeneration
- Respiratory disorders
- Cardiac diseases
- Cancer
- Early ageing
- Transplantation
- Inflammation
- Diabetes

# BAOBAB PULP FRUIT CONTAINS VARIOUS ANTIOXIDANTS COMPOUNDS:

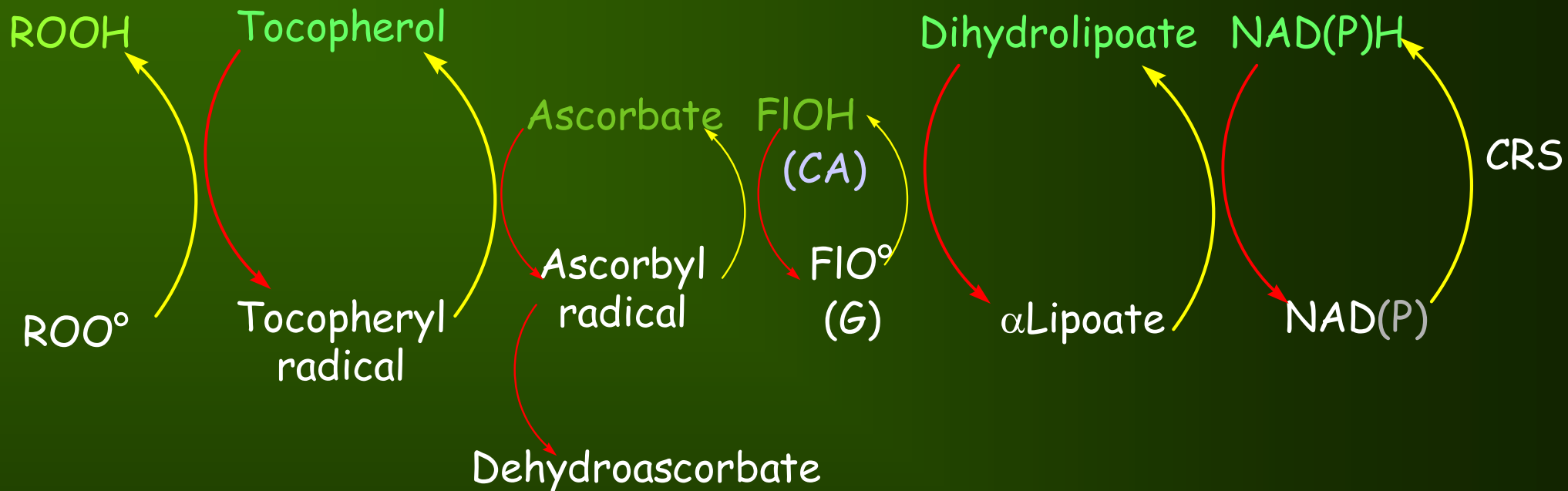
- High concentration of Vitamin C (300 mg/100 g corresponding to the content of six oranges)
- Bioflavonoids
- Alfa Linolenic acid
- Provitamin A

COMPOUNDS THAT WORK SYNEGISTICALLY





# Recycling Antioxidants



CA: Carnosic acid G: Galdosol

CRS: Cellular Reduction Systems

## Ascorbate and Vitamin E recycling pathways.

Ascorbate is regenerated from its radical form by thiols, either enzymatically (GSH) or non-enzymatically (NAD(P)H-dependent). Flavonoids (FLOH) are proposed to act as H-donor restoring ascorbate and generating a flavonoid radical (FLO°)

Cossins E., Lee R., Packer L. *Biochem. & Mol. Biol. Intl.* 3, 583-597, 1998.



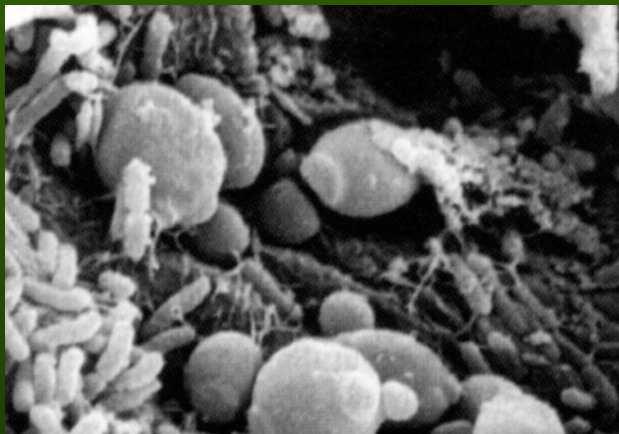
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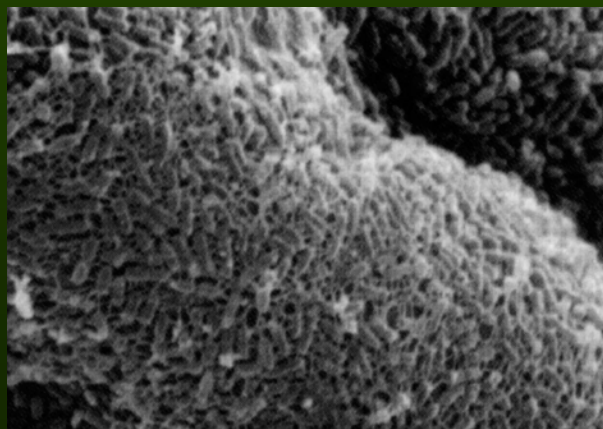
BAOBAB PULP FRUIT CONTAIN ABOUT 50% OF FIBRES

25% water insoluble

25% water soluble

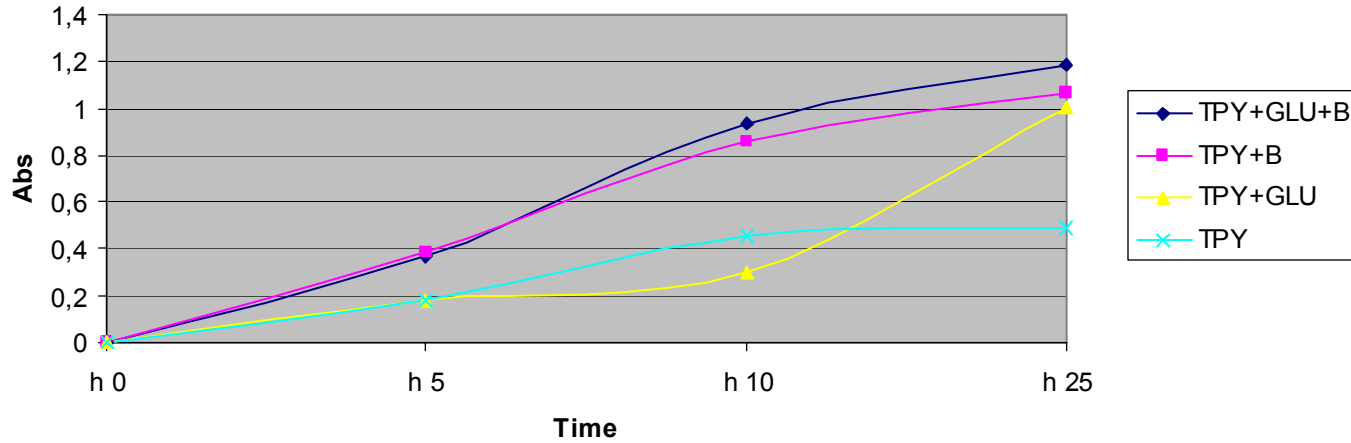


THE SOLUBLE PART  
IS RESPONSABLE OF  
THE PREBIOTIC  
ACTIVITY OF PULP  
FRUIT



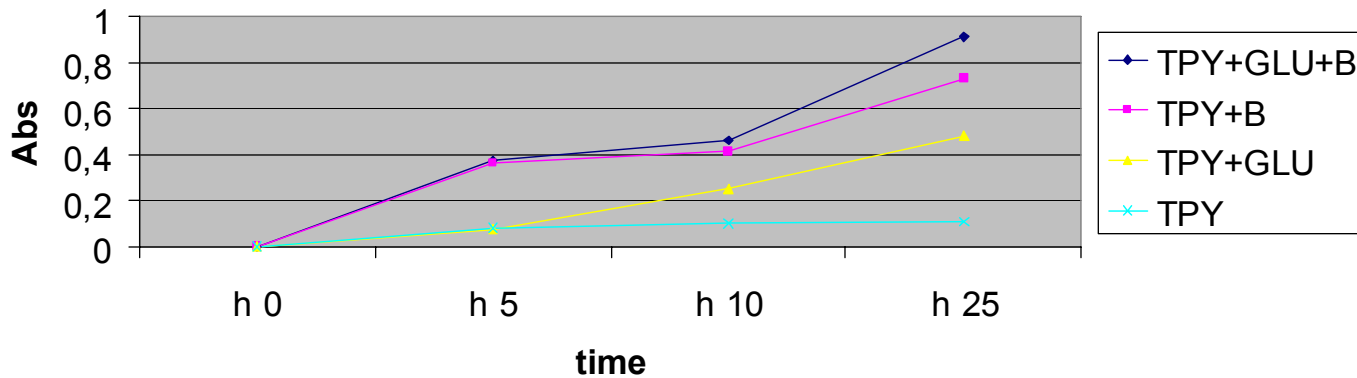
# *In vitro* activity on the promotion of symbiotic bacteria growth

## Bifidobacterium longum



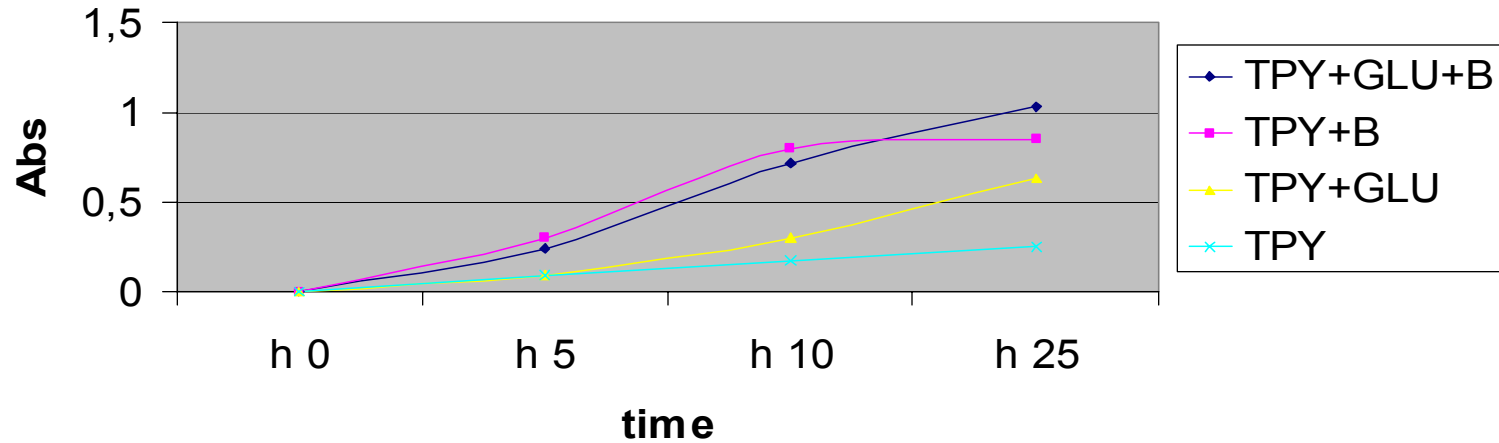
TPY: Basal  
B: Baobab 2%  
GLU: Glucose 2%

## Bifidobacterium infantis



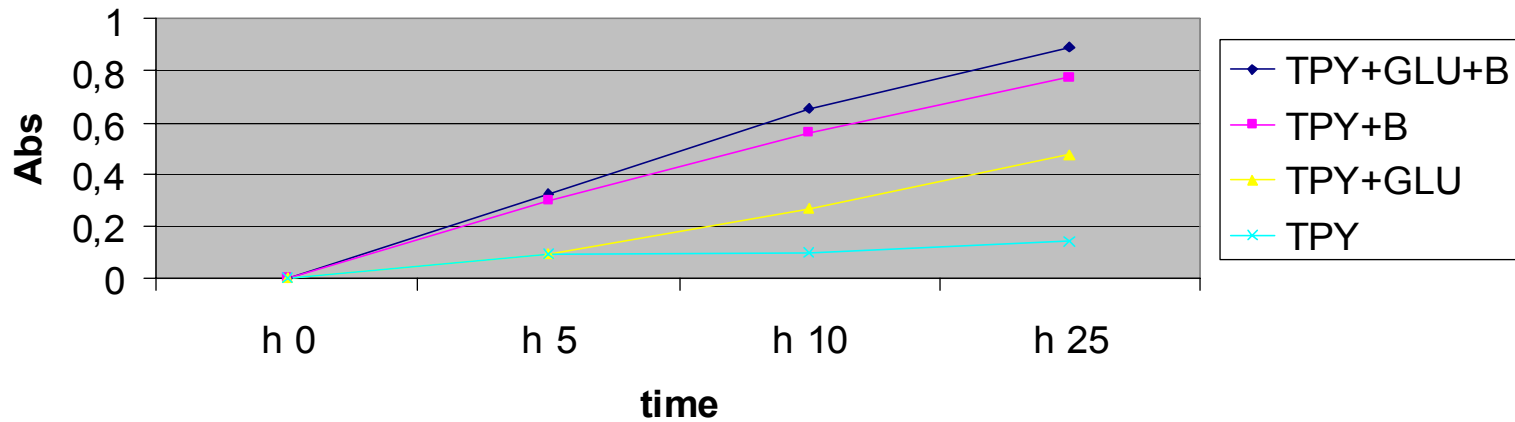
# *In vitro* activity on the promotion of symbiotic bacteria growth

## Bifidobacterium bifidum B16

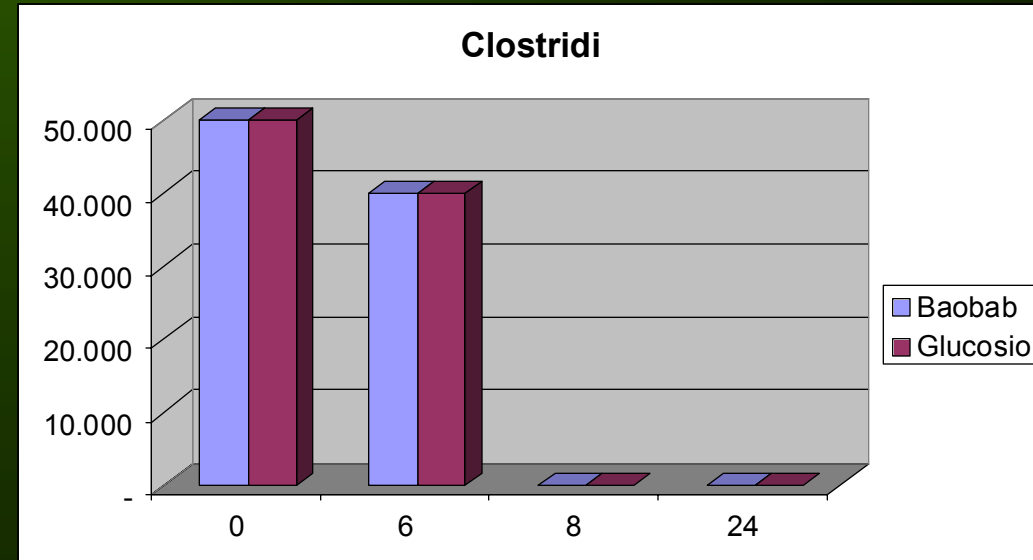
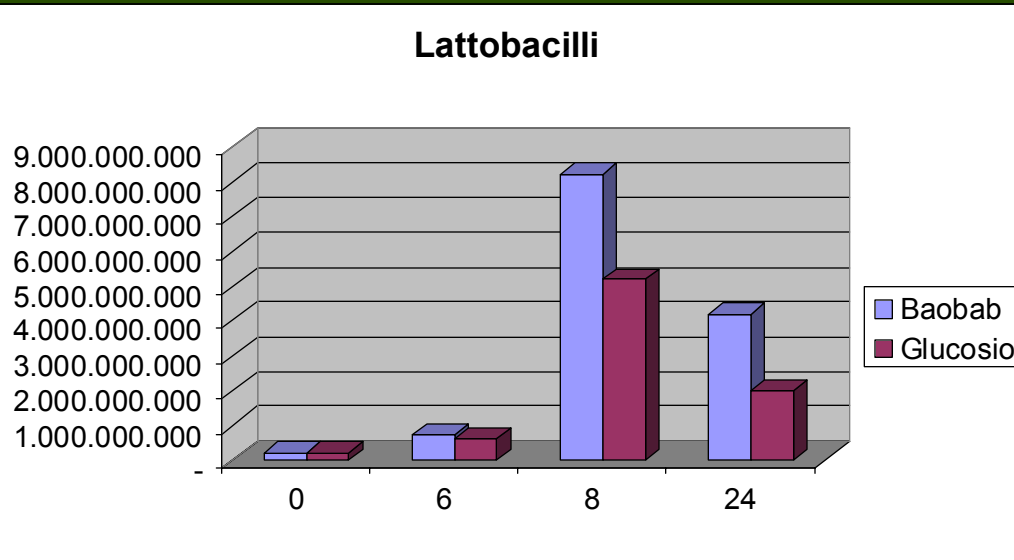
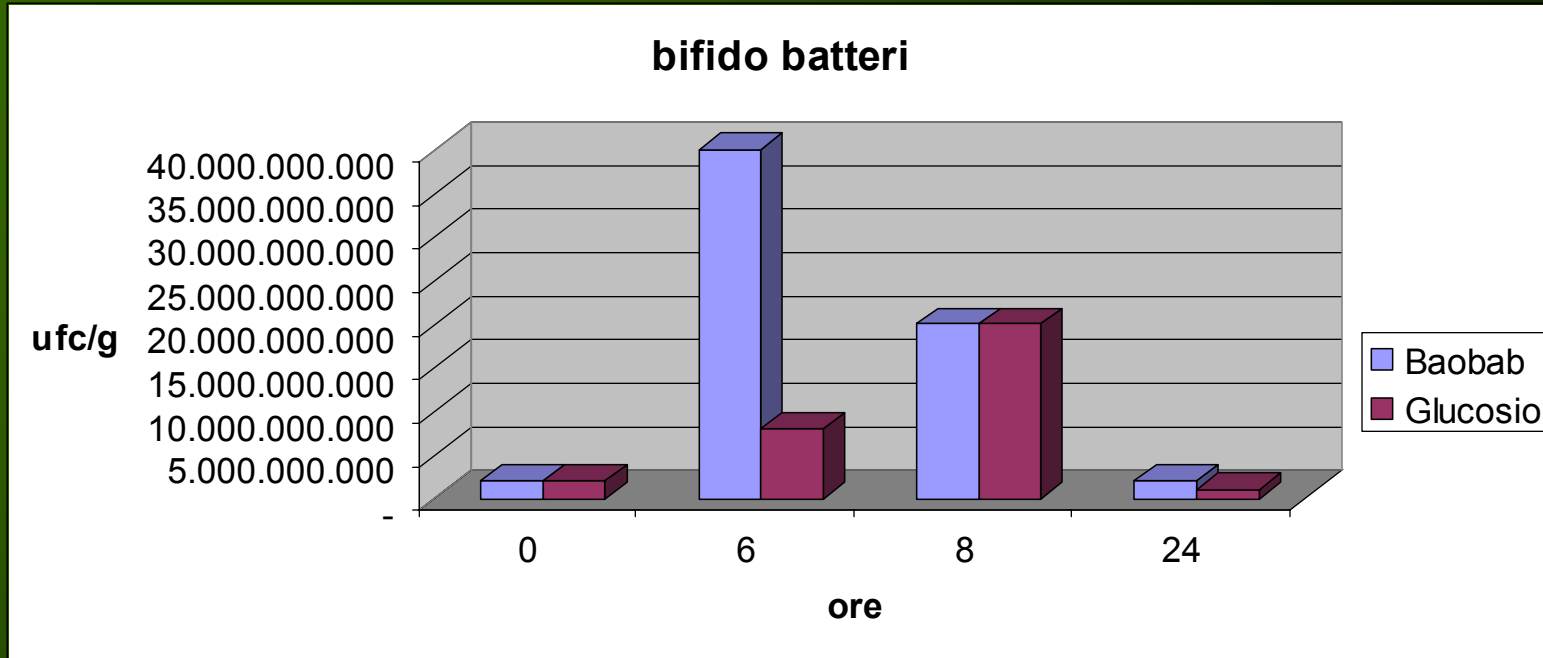


TPY: Basal  
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## Bifidobacterium bifidum A3



# Growth stimulation on infantile faecalis samples



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# BAOBAB PULP FRUIT IS USED IN AFRICA AS ANTI-INFLAMMATORY, ANALGESIC, ANTIPIRETIC

*In vivo* STUDIES ON RATS AND MICE  
DEMONSTRATED IT

500 mg/kg BAOBAB PULP FRUIT corresponds to 15 mg/kg PHENYLBUTAZONE  
and 50 mg/kg ACETYLSALICYLIC ACID

The effect is due to sterols, saponins and triterpenes

## BAOBAB PULP FRUIT MAY BE USED FOR CHRONIC INFLAMMATORY DISEASES

Kerharo J, Adam JG. La pharmacopée sénégalaise traditionnelle. Plantes Médicales et Toxiques. Editions Vigot Frères, Paris, 1974

Ramadan FM, Harraz SA, El-Mougy. Antiinflammatory, analgesic and antipyretic effects of the fruit pulp of *Adansonia digitata*. *Fitoterapia*, 65(5):418-422, 1994

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# BAOBAB PULP FRUIT IS EFFECTIVE AGAINST SOME INTESTINAL DISEASES

## BAOBAB PULP FRUIT HAS BEEN USED TO TREAT INFANTILE DIARRHOEA

**Clinical study on 160 children age 8 months**

Lockett CT, Calvert CC, Grivetti LE. Energy and micronutrient composition of dietary and medicinal wild plants consumed during drought. Study of rural Fulani, Northeastern Nigeria. *Int J Food Sci Nutr*, 51, 195-208, **2000**

Tal-Dia A, Toure K, Sarr O, Sarr M, Cisse MF, Garnier P, Wone I. A baobab solution for the prevention and treatment of acute dehydration in infantile diarrhea. *Dakar Med*, 42(1):68-73, **1997**

Galil NE. Evaluation of Baobab (Gonglase) solution for home management of diarrhoea in Sudanese children. PhD Thesis in Agriculture, 152 pp, Jun **1996**

# EFFECTS ON INTESTINAL TRACT ARE DUE TO FIBRES, TANNINS, MUCILLAGES

- Anti-dysentery and diarrhea because of tannins (astrigent), mucillages (adsorbents), cellulose. Proposed as substitute for WHO-solution.
- Colon normalization (Prebiotic effect)
- Anti-costipation effect because of insoluble fibers and emollient effect

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# BAOBAB PULP FRUIT IS A NATURAL SOURCE OF NUTRIENTS AND MICRONUTRIENTS

- Vitamins C, A, B1, B6, PP
- High source of bioavailable Calcium
- Iron, Magnesium, potassium, Zinc, phosphorus
- Aminoacids, glucose and fructose

BAOBAB PULP FRUIT  
CAN BE USED AS NATURAL  
MULTINUTRIENT SOURCE

Obizoba IC, Anyika JU. Nutritiion value of baobab milk (gubdi) and mixtures of baobab (*Adansonia digitata* L.) and hungry rice, acha (*Digitaria exilis*) flours. *Plants Foods Hum Nutr*, 46(2):157-165, 1994

Lockett CT, Calvert CC, Grivetti LE. Energy and micronutrient composition of dietary and medicinal wild plants consumed during drought. Study of rural Fulani, Northeastern Nigeria. *Int J Food Sci Nutr*, 51, 195-208, 2000

Odetokun SM. The nutritive value of Baobab fruit (*Adansonia digitata*). *Riv Ital Sost Grasse*, 73, 371-373, 1996

# Baobab fruit pulp is rich in:

- Aminoacids: proline, histidine, leucine, lysine, arginine, isoleucine, methionine, cysteine, phenylalanine, glutamic acid, valine, tyrosine, tryptophan, threonine.
- Minerals: calcium (2mg/g), phosphorous (0.9-2 mg/g), iron, potassium (0.02mg/g), sodium, magnesium, zinc, manganese.
- Vitamins: vitamin C (3 mg/g), vitamin A, vitamin B1-B2-B6, vitamin PP.
- Carbohydrates: glucose (0.08 mg/g), fructose (0.17mg/g), saccharose (0.1mg/g), maltose, soluble polysaccharides, starch (0.4mg/g).

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# BAOBAB PULP FRUIT POWDER HAS GOOD LUBRIFICATING, BINDING- AGENT, DILUTING CHARACTERISTICS

In some studies it was used, as hydrophilic excipient,  
for the preparation of paracetamol and theophylline tablets

## BAOBAB PULP FRUIT CAN BE USED AS NATURAL EXCIPIENT IN NATURAL PRODUCTS

Arama E, Michaud P, Rouffiac R, Rodriguez F. Biodisponibilité de comprimés à libération prolongée de théophylline et de paracétamol formulés avec la pulpe de fruit du baobab (*Adansonia digitata* L.). *Pharm Acta Helv*, 64(4):116-120, **1989**  
Arama E, Michaud P, Rouffiac R, Rodriguez F. Un nouvel excipient en formulation pharmaceutique de comprimés de théophylline, type matrice hydrophile: la pulpe de fruit du baobab (*Adansonia digitata* L.). *Farmaco [Prat]*, 43(10):303-15, **1988**

# BAOBAB SEEDS



- The seeds can be eaten fresh, dried or roasted and are sometimes used as a coffee substitute
- The seedcake, as well as the shells from the fruit, are a useful stockfeed, being high in protein, calcium, vitamin B<sub>1</sub> and vitamin C.
- **SEED OIL:** Seeds are used to extract a clear, golden-yellow mobile oil, that has a slight nutty aroma.
- **Constituents:** equal measure of **palmitic acid**, **oleic acid** and **linoleic acid**; small quantities of **stearic** and **cyclopropenoid acids**
- It has been used extensively for cooking.

# SEED OIL

- **PROPERTIES:** moisturizing benefits for skin care, hair conditioner: interesting ingredient in skin care formulations, such as lotions and cremes.
- **STABILITY:** advantage of Baobab over other oils is its stability during storage.
- It stores longer than other unrefined oils and blends easily with other essential and fixed oils. it is used in the cosmetics industry, and is edible.

# LEAVES



- The leaves (fresh and dried) are used in cooking as a type of spinach and can also be used as forage
- **FRESH LEAVES:** are rich in Vitamin C as well as in uronic acids, rhamnase and other sugars, tannins, potassium tartrate, catechins, etc.

**THERAPEUTIC PROPERTIES:** diaphoretic | expectorant | astringent | prophylactic against fever | antihistamine

**APPLICATION:** kidney and bladder diseases | asthma | general fatigue | diarrhoea | inflammations | insect bites | Guinea worm

# Dried leaves powder

In the Pharmacopée traditionnelle sénégalaise the powder of the dried leaves is used as

- **Antiasthmatic** (property that the researchers give to the presence of Adansonia flavonoside composed of dehydroxyflavane)
- **Antidysenteric**
- **Antirachitic**
- **Tonic**
- **Antipiretic** (when used as an herbal tea)
- **Antidiaphoretic**
- **Emollient** (either by internal usage or external use, for cosmetic products)
- **Anti-inflammatory** for urinary-tracts

# Micro-nutrient composition

## Dried leaves

Calcium: 2.266

Phosphorus: 26,1

Vitamin C: Traces

Thiamine: 0,13

Riboflavine: 0,82

Niacine: 4,83

## Fresh leaves

• 0.180 to 0.343

• 0.38 to 0.53

• Equivalent to 4856 Mcg of Vitamin A

All data are expressed in g/on 100 g of product

**CHIMIC COMPOSITION  
OF DRIED LEAVES**

<b>Autor</b>	<b>Water</b>	<b>Protides</b>	<b>Lipids</b>	<b>Glucide</b>	<b>Ash</b>	<b>Celluloses</b>	
<b>Pales (L.)</b>							
	146	10.5	5.3	13.75	12.2	11.3	
<b>Toury and coll. (1)</b>							
	11.5	13.1	2.3	-	8.8	-	
<b>Lunven (P.) et coll.</b>							
	11.5	11.35	-	14.75	8.5	18.3	
<b>Toury and coll. (2)</b>							
	11.7	13.1	2.28	53.5	9	10.4	
<b>Toury and coll. (3)</b>							
	12	12.5	2.89	-	9.62	10	
<b>Da ko</b>							
	8.20	13.2	-	-	11.7	11.5	
<b>Busson (F.)</b>							
	13.35	10.3	3.55	-	10.8	10.2	

# BAOBAB BARK

- Use: High moisture content of the wood (40% or above) renders it unusable as a timber, its bark makes an excellent fibre, employed in basket, rug and rope-making, and has been used variously to make fishing nets, animal snares, sacking and even strings for musical instruments.

## THERAPEUTIC USE:

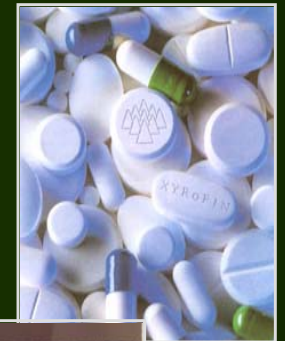
A decoction of baobab bark can be used to control malaria.

The bark, which contains several flavonols, has been distributed commercially in Europe under the name 'cortex cael cedra', as a fever treatment, and substitute for cinchona bark.



# APPLICATION OF BAOBAB PULP FRUIT

•HEALTH SUPPLEMENTS



•FUNCTIONAL FOOD INGREDIENTS



•COSMETOLOGY



# HEALTH APPLICATION OF BAOBAB PULP FRUIT

POTENT NATURAL ANTIOXIDANT MIXTURE

ANTI-DIARRHOEA AND DYSENTERY ESPECIALLY IN  
INFANTS

PREBIOTIC IN ASSOCIATION WITH PROBIOTICS

ANTI-COSTIPATION NATURAL PRODUCT

FIBERS SOURCE IN WEIGHT-LOSS PRODUCTS

PRODUCTS FOR FITNESS

# HEALTH APPLICATION OF BAOBAB PULP FRUIT

ANTI-INFLAMMATORY PRODUCTS

FUNCTIONAL FOODS (YOGURT)

WOMAN HEALTH PRODUCT

PREVENTION OF SUN SKIN DAMAGE

NATURAL EXCIPIENT, ALSO FOR DRUG FORMULATION

FUNCTIONAL FLAVOUR FOR TABLETS

# MARKETING CLAIMS

- 🧠 REALY TOTALLY NATURAL
- 🧠 THE HARVESTING DO NOT DESTROY THE TREE AND ITS ECOSYSTEM
- 🧠 HELP AFRICA
- 🧠 ORGANIC
- 🧠 ESOTIC BUT WELL-KNOWN TREE
- 🧠 SUPPORTED BY LITERATURE AND CENTURIES-OLD TRADITIONAL USE
- 🧠 SAFE



"IF YOU SET ABOUT IT TOO LATE,  
YOU CAN NEVER GET RID OF IT AGAIN"  
Antoine de Saint-Exupéry, *The little prince*



"I BAOBAB PRIMA DI DIVENTAR GRANDI COMINCIANO  
CON L'ESSERE PICCOLI"

Antoine de Saint-Exupéry, The little prince

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