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
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

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Average on 100 g. of pulp</th>
<th>% RDA*</th>
<th>RDA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energetic Value</td>
<td>131 Kcal/555 KJ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>5.3 g.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>30 g.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat</td>
<td>0.15 g.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alimentar Fiber</td>
<td>48 g.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>0.002 g.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td>200 mcg.</td>
<td>25 %</td>
<td>800 mcg.</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>300 mg.</td>
<td>500 %</td>
<td>60 mg.</td>
</tr>
<tr>
<td>Thiamine (B1)</td>
<td>0.48 mg.</td>
<td>34 %</td>
<td>1.4 mg.</td>
</tr>
<tr>
<td>Riboflavine (B2)</td>
<td>0.28 mg.</td>
<td>17 %</td>
<td>1.6 mg.</td>
</tr>
<tr>
<td>Niacine (PP)</td>
<td>3 mg.</td>
<td>17 %</td>
<td>18 mg.</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>2.13 mg.</td>
<td>106 %</td>
<td>2 mg.</td>
</tr>
<tr>
<td>Calcium</td>
<td>265 mg.</td>
<td>33 %</td>
<td>800 mg.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>210 mg.</td>
<td>26 %</td>
<td>800 mg.</td>
</tr>
<tr>
<td>Iron</td>
<td>7 mg.</td>
<td>50 %</td>
<td>14 mg.</td>
</tr>
</tbody>
</table>

RDA*: recommended daily dose

### AMINOACIDS

<table>
<thead>
<tr>
<th>AMINOACIDS</th>
<th>CONC. on g/100g Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proline (PRO)</td>
<td>2.35 g/100 g</td>
</tr>
<tr>
<td>Histidine (HIS)</td>
<td>2.71 g/100 g</td>
</tr>
<tr>
<td>Leucine (LEU)</td>
<td>8.41 mg/100 g</td>
</tr>
<tr>
<td>Lysine (LIS)</td>
<td>14.62 g/100 g</td>
</tr>
<tr>
<td>Arginine (ARG)</td>
<td>6.04 g/100 g</td>
</tr>
<tr>
<td>Isoleucine (ILE)</td>
<td>10.73 g/100 g</td>
</tr>
<tr>
<td>Methionine (MET)</td>
<td>4.92 g/100 g</td>
</tr>
<tr>
<td>Cystine (CYS)</td>
<td>11.23 g/100 g</td>
</tr>
<tr>
<td>Phenylalanine (PHE)</td>
<td>4.11 g/100 g</td>
</tr>
<tr>
<td>Glutamic Acid (GLU)</td>
<td>4.02 g/100 g</td>
</tr>
<tr>
<td>Valine (VAL)</td>
<td>1.62 g/100 g</td>
</tr>
<tr>
<td>Tyrosine (TYR)</td>
<td>4.21 g/100 g</td>
</tr>
<tr>
<td>Tryptophan (TRP)</td>
<td>1.49 g/100 g</td>
</tr>
<tr>
<td>Threonine (THR)</td>
<td>2.96 g/100 g</td>
</tr>
</tbody>
</table>
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

Eichelbaum M., Gross S. Advances Drug Res. 1996, 64
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

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°)

TOTAL ANTIOXIDANT CAPACITY OF BAOBAB FRUIT PRODUCTS

Lipid-Soluble (ACL) antioxidant Capacity

Water-soluble (ACW) antioxidant capacity

PCL Assay versus Trolox used as a standard

DATA FROM UNIVERSITY OF FERRARA

© BAOBAB FRUIT COMPANY
HEALTH BENEFITS

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- Anti-inflammatory, analgesic, antipyretic activity
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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**

- TPY: Basal
- B: Baobab 2%
- GLU: Glucose 2%
In vitro activity on the promotion of symbiotic bacteria growth

**Bifidobacterium bifidum B16**

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

**Bifidobacterium bifidum A3**
Growth stimulation on infantile faecalis samples

EFFECT OF BAOBAB PULP FRUIT ON BACTERIA GROWTH

© PATENT APPLICATION OF BAOBAB FRUIT COMPANY
HEALTH BENEFITS

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


HEALTH BENEFITS

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


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

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

• Antioxidant
• Source of soluble fibers with PREBIOTIC activity*
• Anti-inflammatory, analgesic, antipyretic activity
• Anti-diarrhoea, anti-dysentery activity, anti-costipation
• Source of micronutrients
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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

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

- **Amino acids**: 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).
HEALTH BENEFITS

- Antioxidant
- Source of soluble fibers with PREBIOTIC-LIKE activity
- Anti-inflammatory, analgesic, antipyretic activity
- Anti-diarrhoea, anti-dysentery activity, anti-costipation
- Source of micronutrients
- **Natural and interesting excipient**
BAOBAB PULP FRUIT POWDER HAS GOOD LUBRICANTING, 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


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 B₁ 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, rhamnose 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 g
- **Phosphorus:** 26.1 g
- **Vitamin C:** Traces
- **Thiamine:** 0.13 g
- **Riboflavine:** 0.82 g
- **Niacine:** 4.83 g

**Fresh leaves**

- **0.180 to 0.343** g
- **0.38 to 0.53** g
- **Equivalent to 4856 Mcg of Vitamin A**

All data are expressed in g/on 100 g of product.
<table>
<thead>
<tr>
<th>Autor</th>
<th>Water</th>
<th>Protides</th>
<th>Lipids</th>
<th>Glucide</th>
<th>Ash</th>
<th>Celluloses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pales (L.)</td>
<td>146</td>
<td>10.5</td>
<td>5.3</td>
<td>13.75</td>
<td>12.2</td>
<td>11.3</td>
</tr>
<tr>
<td>Toury and coll. (1)</td>
<td>11.5</td>
<td>13.1</td>
<td>2.3</td>
<td>-</td>
<td>8.8</td>
<td>-</td>
</tr>
<tr>
<td>Lunven (P.) et coll.</td>
<td>11.5</td>
<td>11.35</td>
<td>-</td>
<td>14.75</td>
<td>8.5</td>
<td>18.3</td>
</tr>
<tr>
<td>Toury and coll. (2)</td>
<td>11.7</td>
<td>13.1</td>
<td>2.28</td>
<td>53.5</td>
<td>9</td>
<td>10.4</td>
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<tr>
<td>Toury and coll. (3)</td>
<td>12</td>
<td>12.5</td>
<td>2.89</td>
<td>-</td>
<td>9.62</td>
<td>10</td>
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<tr>
<td>Dako</td>
<td>8.20</td>
<td>13.2</td>
<td>-</td>
<td>-</td>
<td>11.7</td>
<td>11.5</td>
</tr>
<tr>
<td>Busson (F.)</td>
<td>13.35</td>
<td>10.3</td>
<td>3.55</td>
<td>-</td>
<td>10.8</td>
<td>10.2</td>
</tr>
</tbody>
</table>
BAOBAB BARK

• Use: High moisture content of the wood (40% or above) renders it unusable as a timber, its bark makes and 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 TO 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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**Further investigations on the antiviral activities of medicinal plants of Togo.**

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**Useful plants in traditional control of insect pests**

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**Fat content and fatty acid composition of oils extracted from selected wild-gathered tropical plant seeds from Nigeria.**

**Utilization of baobab (Adansonia digitata L.) leaf-meal for egg yolk pigmentation in layers.**

**Provitamin A content of traditional green leaves from Niger.**
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Amino acid, fatty acid, and mineral composition of 24 indigenous plants of Burkina Faso.

Nutrient composition and nutritional importance of green leaves and wild food resources in an agricultural district, Koutiala, in Southern Mali.

The nutritive value of Baobab fruit (Adansonia digitata).

Fatty acid compositions of tigernut tubers (Cyperus esculentus L.), baobab seeds (Adansonia digitata L.), and their mixture.

Baobab - homegrown vitamin C for Africa.

Mineral values of selected plant foods common to southern Burkina Faso and to Niamey, Niger, West Africa.

The amino acid and mineral content of baobab (Adansonia digitata L.) leaves.

Anti-inflammatory, analgesic and antipyretic effects of the fruit pulp of Adansonia digitata.

Nutritive value of baobab milk (gubdi) and mixtures of baobab (Adansonia digitata L.) and hungry rice, acha (Digitaria exilis) flours.

Evaluation of mineral elements and ascorbic acid contents in fruits of some wild plants.

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Nutritional value of edible fruits of indigenous wild trees in Malawi.

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Biochim-Biophys-Acta. 1993 Dec 2; 1210(1): 27-34

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J-Nutr. 1998 Nov; 128(11); 2014-22
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Khartoum (Sudan). Jun 1996. 152 p

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