

# Baobab 1990 - 2004

**Author** S. S. Dhillion and G. Gustad  
**Title** Local management practices influence the viability of the baobab (*Adansonia digitata*)  
**Year** 2004  
**Source title** Agriculture, Ecosystems & Environment  
**Reference** 101(1): 85-103

## Abstract

In west Africa, the alarming rate of land use intensification and the assumed deterioration of parkland species calls for assessments of locally valued non-timber forest product (NTFP) yielding populations. This study focused on the baobab tree, *Adansonia digitata* Linn., in Cinzana, Mali. Here by conducting biological inventories in different land use types and interviews we addressed the following central questions. (1) How does the harvesting of baobab NTFPs in different land use types (fallow, cropland, and village (habitation) areas) affect the viability of its population? (2) By which ways do humans, other than by harvesting, affect the viability of the population? The viability of a population is, in this study, treated as a characteristic that is determined by the mature population size and its regeneration potential (recruit population). Baobab products in Cinzana are used on a regular basis and valued in a cultural context, like in many parts of west Africa. For the local society, the sustained viability of the baobab populations is therefore essential. Fruit harvesting has an impact on dispersal and establishment, while leaf harvesting causes mutilation that reduces the number of fruits on each tree. Mutilation was more severe in cropland than in fallows, and cropland individuals were most prone to damages from plowing and livestock. The baobab populations were, however, more dense and comprised more recruits, in cropland and village areas compared to fallows, and seedlings were in fact not found in fallow. These differences are explained by management practices related to the land use type. In addition to the differences in baobab density and population structure between cropland and fallows, the weak correlation between density of recruits and mature individuals testifies to the importance of the specific ecological role that humans play in baobab dispersal and establishment. Clearly, harvesting is not the only way by which humans influence the viability of baobab populations. Some practices are beneficial, either intentional (e.g. seedling protection, transplanting) or unintentional (e.g. dispersal of seeds in garbage), while others are detrimental (e.g. livestock browsing, plowing). At present local management practices contribute to sustain the viability of the species. The results point to the fact that the baobab population is not declining but in need of management that secures the maintenance of a genetically diverse population.

**Author** Ajayi, I. A., F. A. Dawodu, R. A. Oderinde and A. Egunyomi  
**Title** Fatty acid composition and metal content of adansonia digitata seeds and seed oil  
**Year** 2003  
**Source title** Rivista Italiana Delle Sostanze Grasse  
**Reference** 80(1): 41-44  
**Abstract**

-

**Author** Buter, J. and J. P. Wilson  
**Title** The baobab metaphor for sustainable organisational development at the grassroots  
**Year** 2003  
**Source title** Development in Practice  
**Reference** 13(1): 110-115  
**Abstract**

-

**Author** D. B. K. Dovie  
**Title** Rural economy and livelihoods from the non-timber forest products trade. Compr  
**Year** 2003  
**Source title** International Journal of Sustainable Development and World Ecology  
**Reference** 10(3): 247-262

**Abstract**

The role of non-timber forest products in sustaining rural economies of the southern African region has been underestimated because of inadequate policy recognition. As a result, factors affecting the sustainability of these important resources are being undermined. The aim of the paper is to examine trade in two selected NTFPs and implications for sustaining the resource base in Zimbabwe and South Africa. In eastern Zimbabwe, baobab (*Adansonia digitata*) bark is harvested for craft purposes, but in danger of destruction in the short term as a result of harvesting and trade arrangements. Unless appropriate harvesting and marketing mechanisms including harvesting cycles and adaptive management are adopted, the baobabs and livelihoods of humans will be threatened in the next decade. For wood products from communal woodlands in the South African study, uncontrolled trade poses danger to sustaining the natural woodlands. In both case studies, the role of non-resident NTFP dealers is a source of inevitable threat in promoting sustainable harvesting and trade. Market forces of demand and supply factors are identified as opportunities or threats and presented in a conceptualised framework. Additionally, the NTFP sector management will need to include opportunistic improvement of small-scale agropastoralism.

**Author** J. Buter and J. P. Wilson  
**Title** The baobab metaphor for sustainable organisational development at the grassroots  
**Year** 2003  
**Source title** Development in Practice  
**Reference** 13(1): 110-115

**Abstract**

This paper provides insights into how grassroots community-based organizations (CBOs) might encourage long-term and effective organizational development and foster capacity building. An action-research approach developed in Niger, which is based on workshops that use proverbs, poems, storytelling, group discussion, and role-plays, is presented. In particular, the "baobab model" (i.e. the metaphorical comparison of the baobab tree and the eucalyptus tree), which can serve to assist in CBO development, training, and evaluation, is discussed.

**Author** J. Gebauer, K. El-Siddig, A. A. Salih and G. Ebert  
**Title** Effect of different levels of NaCl-induced salinity on growth, photosynthesis, leaf  
**Year** 2003  
**Source title** Journal of Applied Botany  
**Reference** 77(3/4): 103-107

**Abstract**

The effect of salinity on growth, photosynthesis, leaf chlorophyll concentration and mineral uptake of baobab seedlings (*Adansonia digitata* L.) was investigated. Four weeks old seedlings were grown in sand culture and were treated with different salt solutions. Treatments were prepared by adding 0, 20, 40, 60, and 80 mM NaCl to the nutrient solution. Plant growth was strongly affected by the salt treatments. In the 20 mM NaCl variant, a reduction of 66% dry weight occurred in comparison to the control plants. Foliar injuries (necrosis) and defoliation appeared within all salt treatments. However, with increasing salinity levels, leaf moisture content increased, indicating a salt-induced leaf succulence. Increased NaCl salinity decreased the net photosynthesis rate. Chlorophyll content of leaves at higher salinity levels was lower than at lower salinity levels. Raising NaCl in the irrigation solution increased Na<sup>+</sup> and Cl<sup>-</sup> concentration in the plant tissue. Ca<sup>2+</sup>/Na<sup>+</sup> and K<sup>+</sup>/Na<sup>+</sup> ratios in the leaves were strongly reduced in salt treated plants. The results indicate that salinity significantly influences growth and metabolism of *A. digitata* seedlings. Therefore, in the seedling stage, baobab can be characterised as a very salt-sensitive species.

**Author** N. M. Nnam and P. N. Obiakor  
**Title** Effect of fermentation on the nutrient and antinutrient composition of baobab (Ad  
**Year** 2003  
**Source title** Ecology of Food and Nutrition  
**Reference** 42(4/5): 265-277

**Abstract**

This study is part of an ongoing investigation on the effect of fermentation on chemical and antinutrient compositions of baobab seeds and rice grains. Baobab seeds and rice grains were cleaned and fermented for 24, 48, and 72 h, respectively, by the microflora present in both the seed and the grains. The pH and titratable acidity of the unfermented and fermented samples were determined. The samples were dried and milled into fine flours respectively. Standard assay techniques were used to evaluate the flours for proximate, mineral, and some antinutrient composition. Fermentation of baobab decreased protein and carbohydrate but increased fat levels. The rice carbohydrate and fat were decreased during fermentation except for the carbohydrate of the 48 and 72 h fermented samples. Protein was only increased in the 24 h fermented rice. Fermentation had varied effects on the mineral concentrations of the baobab seeds and the rice grains. It reduced their antinutrients (phytate and tannins), decreased pH, and increased the titratable acidity of the samples. The biochemical and biological evaluation of the blends of baobab and rice flours as complementary food is in progress in this laboratory.

**Author** Shukla, Y. N., S. Dubey, A. Srivastava, S. P. Jain and S. Kumar  
**Title** Antibacterial activity and some chemical constituents of adansonia digitata linn  
**Year** 2003  
**Source title** Indian Drugs  
**Reference** 40(3): 186-187

**Abstract**

-

**Author** Vedauyas, C. D. Patil, S. Sreevatsa and B. Nagaraj  
**Title** The rare African baobab tree in Karnataka Adansonia digitata Linn Bombacaceae.  
**Year** 2003  
**Source title** Myforest  
**Reference** 39(1): 77-80

**Abstract**

This paper describes the habitat, morphology and economic importance of the rare African baobab ( A d a n s o n i a d i g i t a t a ) t r e e i n K a r n a t a k a , I n d i a .

**Author** Dutheil, J. and N. Galtier  
**Title** Baobab: A java editor for large phylogenetic trees  
**Year** 2002  
**Source title** Bioinformatics  
**Reference** 18(6): 892-893

**Abstract**

-

**Author** Gebauer, J., K. El-Siddig and G. Ebert  
**Title** Baobab (*adansonia digitata* L.): A review on a multipurpose tree with promising fu  
**Year** 2002  
**Source title** Gartenbauwissenschaft  
**Reference** 67(4): 155-160  
**Abstract**

-

**Author** J. Gebauer, K. El-Siddig and G. Ebert  
**Title** Baobab (*Adansonia digitata* L.): a review on a multipurpose tree with promising f  
**Year** 2002  
**Source title** Gartenbauwissenschaft  
**Reference** 67(4): 155-160  
**Abstract**

Africa has abundant wild plants and cultivated native species with great agronomic and commercial potential as food crops. However, many of these species, particularly the fruits and nuts, have not been promoted or researched and therefore remain underutilized. Moreover, many of these species face the danger of loss due to increasing human impact on ecosystems. Sudan, as in many other African countries, is endowed with a range of edapho-climatic conditions that favour the establishment of many plant species, most of which are adapted to specific ecological zones. Among these plants is the baobab (*A. digitata*) which is a fruit-producing tree belonging to the family Bombacaceae. The baobab has an exceedingly wide range of uses ranging from food and beverages to medicinal uses. Despite its potential, which is well recognized, very little is known about the tree phenology, floral biology, husbandry or genetic diversity. In this article, we have aimed to bring out detailed information on various aspects of its botany, ecology, origin, propagation and cultivation, main uses, genetic improvement and especially its importance in the nutrition and poverty alleviation in Sudan.

**Author** Layser EF  
**Title** Africa's tree of life legends, uses, and traditions of the baobab  
**Year** 2001  
**Source title** World and I  
**Reference** 16(7): 152-159  
**Abstract**

-

**Author** Orata, D. and P. W. Ondachi  
**Title** Enhanced electro detection of ascorbic acid in adansonia digitata fruit by use of su  
**Year** 2001  
**Source title** Catalysis Letters  
**Reference** 72(1/2): 125-128  
**Abstract**

-

**Author** Agnarsson, I.  
**Title** Adansonia is a baobad tree, not a theridiid spider  
**Year** 2000  
**Source title** Journal of Arachnology  
**Reference** 28(3): 351-352  
**Abstract**

-

**Author** Ba AM; Plenchette C; Danthu P; Duponnois R; Gu  
**Title** Functional compatability of two arbuscular mycorrhizae with thirteen fruit trees in  
**Year** 2000  
**Source title** Agroforestry Systems  
**Reference** 50: 95-105  
**Abstract**

-

**Author** Diop, M. C., M. Diouf and A. Diaw  
**Title** Le baobab a ete deracine. L'alternance au senegal  
**Year** 2000  
**Source title** Politique Africaine  
**Reference** (78): 157-179  
**Abstract**

-

**Author** Ranger, T.  
**Title** The fruits of the baobab: Irene staunton and the zimbabwean novel  
**Year** 1999  
**Source title** Journal of Southern African Studies  
**Reference** 25(4): 695-702  
**Abstract**

-



**Author** Ashorobi, R. B. and A. O. Joda  
**Title** Positive inotropic effect of the extract of *Adansonia digitata* (Linn) on isolated atri  
**Year** 1998  
**Source title** Discovery and Innovation  
**Reference** 10(3/4): 250-254  
**Abstract**

-

**Author** Barminas JT; Carles M; Emmanuel D  
**Title** Mineral composition of non-conventional leafy vegetables  
**Year** 1998  
**Source title** Plant Foods for Human Nutrition  
**Reference** 53(1): 29-36  
**Abstract**

-

**Author** Baum DA; Small RL; Wendel JF  
**Title** Biogeography and floral evolution of Baobabs (*Adansonia*, Bombacaceae) as inferred from  
**Year** 1998  
**Source title** Systematic Biology  
**Reference** 47(2): 181-207

**Abstract**

The phylogeny of baobab trees was analyzed using four data sets: chloroplast DNA restriction sites, sequences of the chloroplast rpl16 intron, sequences of the internal transcribed spacer (ITS) region of nuclear ribosomal DNA, and morphology. We sampled each of the eight species of *Adansonia* plus three outgroup taxa from tribe Adansonieae. These data were analyzed singly and in combination using parsimony. ITS and morphology provided the greatest resolution and were largely concordant. The two chloroplast data sets showed concordance with one another but showed significant conflict with ITS and morphology. A possible explanation for the conflict is genealogical discordance within the Malagasy Longitubae, perhaps due to introgression events. A maximum-likelihood analysis of branching times shows that the dispersal between Africa and Australia occurred well after the fragmentation of Gondwana and therefore involved overwater dispersal. The phylogeny does not permit unambiguous reconstruction of floral evolution but suggests the plausible hypothesis that hawkmoth pollination was ancestral in *Adansonia* and that there were two parallel switches to pollination by mammals in the genus. Wild and cultivated fruits, leaves, nuts, seeds, spices and vegetables from southern Burkina Faso and Niamey, Niger, were analysed for their copper, iron, magnesium, manganese and zinc concentrations and compared to imported, exotic reference foods found within the study area. The species analysed covered a broad spectrum of local diet; 33 were wild and 16 were cultivated. The edible wild plants were often the highest in mineral concentrations. Five species analysed, exhibited consistently high mineral values, specifically, *Adansonia digitata*, *Boerhavia diffusa*, *Cerathoteca sesamoides*, *Sclerocarya birrea* and *Xylopi* sp. The latter was particularly high in zinc, an observation which suggests that there may be a solid rationale for local tradition which recommended its consumption during pregnancy and lactation. Respondents indicated that during times of drought, wild plants were not consumed in the volume they once were, due to changes of infrastructure and in famine relief programmes.

**Author** Cook JA; VanderJagt DJ; Dasgupta A; Mounkaila G;  
**Title** Use of the Trolox assay to estimate the antioxidant content of seventeen edible wil  
**Year** 1998  
**Source title** Life Sciences  
**Reference** 63(2): 106-110

**Abstract**

Although wild edible plants of the western Sahel and other parts of sub-Saharan Africa are consumed to some extent at all times of the year, greater amounts are consumed when cereal harvests are insufficient to support the populations living in these areas. The purpose of this study was to use a recently reported Trolox-based assay to measure the total antioxidant capacity of aqueous extracts of 17 plants that we gathered from southern Niger. The antioxidant contents of the aqueous extracts were compared to those of spinach and potato. Of the 17 plants, 11 had a greater antioxidant content than spinach and 14 had a greater antioxidant content than potato. The leaves of *Tapinanthus globiferus* had the greatest antioxidant content, and the fruit of *Parinari macrophylla* had the lowest. In general, leaves contained more antioxidants than either fruits or seeds. The total antioxidant capacity of the aqueous was relatively high, indicating that the wild plants of the western Sahel may contain substantial amounts of water-soluble flavonoid glycosides, which are potent antioxidants and have been shown to have anticancer properties.

**Author** Ezeagu, I. E., K. J. Petzke, E. Lange and C. C. Metges  
**Title** Fat content and fatty acid composition of oils extracted from selected wild-gathere  
**Year** 1998  
**Source title** Journal of the American Oil Chemists Society  
**Reference** 75(8): 1031-1035

**Abstract**

-

**Author** Lancelot, R., B. Faye, X. Juanes, M. Ndiaye, L. Perochon and E. Tillard  
**Title** The baobab database: A tool for modeling small ruminants production and health i  
**Year** 1998  
**Source title** Revue D Elevage Et De Medicine Veterinaire Des Pays Tropicaux  
**Reference** 51(2): 135-146

**Abstract**

-

**Author** Proll J; Petzke KJ; Ezeagu IE; Metges CC  
**Title** Low nutritional quality of unconventional tropical crop seeds in rats  
**Year** 1998  
**Source title** Journal of Nutrition  
**Reference** 128(11): 2014-2022

### **Abstract**

As the search for alternative sources of food to alleviate hunger continues, this study was undertaken to determine the biological value in growing rats (BV) of proteins of some lesser known tropical seeds gathered in Nigeria. Antinutritional factors (trypsin inhibitors, phytic acid, oxalate, tannin, alkaloids) and amino acid compositions were also determined, and protein digestibility-corrected amino acid score (PDCAAS) was calculated using the amino acid requirement pattern of the preschool child and individual seed-specific correction factors for crude protein. A rat growth and balance study was conducted to determine digestibility, nitrogen-, and energy balance by feeding as the only unsupplemented protein source milled and heat-treated seeds of *Adansonia digitata* (Bombacaceae) and *Prosopis africana*, *Lonchocarpus sericeus*, *Enterolobium cyclocarpium*, *Sesbania pachycarpa* and *Pterocarpus osun* (Leguminosae) in comparison to casein fortified with methionine (control). Diets containing *P. africana* L. *sericeus* seeds caused poor feed intake and weight loss in rats and were excluded from the nitrogen-balance test. Among the seed samples, *S. pachycarpa* followed by *A. digitata* showed the most advantageous nutritional quality [amino acid composition, digestibility, BV and net protein utilization (NPU)]. True digestibility was 82.9 and 74.5 vs. 98.5, BV was 64.6 and 70.0 vs. 90.4, and NPU was 53.5 and 52.1 vs. 89.0 for *S. pachycarpa* and *A. digitata* vs, casein (control), respectively. In terms of PDACCS lysine was the first limiting amino acid for *S. pachycarpa* (88%) and for *A. digitata* (58%). The PDCAAS of all essential amino acids was below 100% for *E. cyclocarpium* (e.g., cysteine + methionine: 37%) and for *P. africana* (eg threonine: 46% except valine and a very high content of cycteine and methionine). In conclusion, all seeds tested in the rat balance trial were of inferior quality compared to casein. Before these tropical seeds could be used as food components or feed supplements, safety studies and proper processing to remove antinutritional factors and possible toxic constituents were required.

**Author** Sena LP; Vanderjagt DJ; Rivera C; Tsin ATC; Muhama  
**Title** Analysis of nutritional components of eight famine foods of the Republic of Niger  
**Year** 1998  
**Source title** Plant Foods for Human Nutrition  
**Reference** 52(1): 17-30

**Abstract**

In the western Sahel, indigenous plants become important staples when cereal harvests are inadequate to support populations inhabiting that region of Africa. The purpose of this study was to assess the nutrient content of several of these edible wild plants. The leaves of the following seven plant foods were analyzed: *Ziziphus mauritiana*, *Cerathotheca sesamoides*, *Moringa oleifera*, *Leptadenia hastata*, *Hibiscus sabdarifa*, *Amaranthus viridis*, and *Adansonia digitata*. The fatty acid, vitamin E, carotenoid, selected mineral and amino acid contents of these plant foods were determined. These same analyses were performed on the fruit of the *Adansonia digitata*. In quantitative and qualitative terms, *Amaranthus viridis* was found to be an excellent source of protein. Its amino acid composition compared favorably to that of a World Health Organization (WHO) protein standard. It also contained considerable amounts of the two fatty acids that are essential in humans (linoleic and  $\alpha$ -linolenic) and a number of minerals including iron, magnesium, calcium and zinc. The leaves of *Hibiscus sabdarifa* contained an appreciable quantity of protein the composition of which was comparable to the WHO standard. The mineral content of the leaves of this plant was also exceptionally high; noteworthy was its high zinc content. *H. sabdarifa* also contained significant quantities of the two essential fatty acids. *Ziziphus mauritiana* was an excellent source of the essential fatty acid linoleic acid and several of the metals including iron, calcium, magnesium and zinc. Its content of other essential nutrients, however, was rather low. In general, *Adansonia digitata* leaves were nutritionally superior to the fruit of the tree; however, the fruit did contain useful quantities of potassium, phosphorus, zinc and  $\alpha$ -linolenic acid. The *Leptadenia hastata* leaves were an especially good source of lutein and beta-carotene. These data should be useful to the people who inhabit the western Sahel in helping them devise healthy diets during times when cereal staples are in short supply.

**Author** Sidibe, M., J. F. Scheuring, M. Kone, J. Schierle and M. Frigg  
**Title** A(and c) for africa: The baobab tree as a source of vitamins  
**Year** 1998  
**Source title** Agroforestry Today  
**Reference** 10(4): 7-9

**Abstract**

**Author** Sidibe, M., J. F. Scheuring, M. Kone, P. Hofman and M. Frigg  
**Title** More on baobab's homegrown vitamin C  
**Year** 1998  
**Source title** Agroforestry Today  
**Reference** 10(4): 10

**Abstract**

-

**Author** Toure SF; Michalet Doreau B; Traore E; Friot D; Richard D  
**Title** Occurrence of digestive interactions in tree forage-based diets for sheep  
**Year** 1998  
**Source title** Animal Feed Science and Technology  
**Reference** 74(1): 63-78

**Abstract**

The effect of browse level in the diet on the in vivo dry matter digestibility (DMD) in sheep and the DM degradation of peanut hay in the rumen of cattle-fed tree forage-based diets were investigated in order to detect the occurrence of digestive interactions between diet components. Selected browse species *Acacia albida* pods, *Pithecellobium dulce*, *Adansonia digitata* and *Calotropis procera* leaf samples were collected in the central regions of Senegal, sundried and stored in LNERV animals barns for in vivo trials. Classical in vivo balance trials were performed for each tree forage sample. The proportion of browse in the applied diet varied between 0 and 75% of DM. Regression and difference procedures were both tested to estimate the DMD of the browse component of the diet. DMD capacity in the rumen of three young Gobra bulls fed the browse-based diets was estimated by measurement of the in sacco dry matter degradation profile of a standard sample, peanut hay. For each sample, large variations were observed when the browse DMD was calculated by difference. Both total ration DMD and rumen DM degradation capacity were significantly ( $p < 0.001$ ) influenced by browse level in the diet. However, non-linear response of total diet DMD to increasing levels of browse was observed only in *A. digitata* and *P. dulce* indicating occurrence of digestive interactions in those species. Rumen DM degradation capacity varied according to plant species which played a major role in the observed digestion profile. Results suggest that the digestion of tree forages-based diets may be influenced by digestive interactions but the large variations observed in plant species show their importance. Optimal DM degradation occurred at 15-30% of browse level in the diet for both *A. albida* and *A. digitata* while for *P. dulce* it was at 50%. Corresponding browse digestibility was of 50%, 47.1%, 51.3% and 60.7% DM for *A. albida*, *A. digitata*, *P. dulce* and *C. procera* respectively. Further work using the regression method in a wider range of browse species could help confirm between-species variations.

**Author** Akpp LE; Samb PI; Grouzis M  
**Title** Effect of tree canopies on the specific structure of the herbaceous layer in a sudani  
**Year** 1997  
**Source title** Candollea  
**Reference** 52(2): 287-299  
**Abstract** -

**Author** Boggia, L.  
**Title** Adansonia digitata: Il favotoso baobab  
**Year** 1997  
**Source title** Monti E Boschi  
**Reference** 48(5): 50-51  
**Abstract** -

**Author** Bowman, D. M. J. S.  
**Title** Observations on the demography of the australian boab (adansonia gibbosa) in the  
**Year** 1997  
**Source title** Australian Journal of Botany  
**Reference** 45(5): 893-904  
**Abstract** -

**Author** Butswat IS; Nelson FN; Oyawoye EO; Akande FO  
**Title** Utilization of baobab (*Adansonia digitata* L.) leaf-meal for egg yolk pigmentation  
**Year** 1997  
**Source title** Indian Journal of Animal Sciences  
**Reference** 67(1): 82-83

**Abstract**

-

**Author** Butswat, I. S., F. N. Nelson, E. O. Oyawoye and F. O. Akande  
**Title** Utilization of baobab (*Adansonia digitata* L.) leaf-meal for egg-yolk pigmentation  
**Year** 1997  
**Source title** Indian Journal of Animal Sciences  
**Reference** 67(1): 82-83

**Abstract**

-

**Author** Buwalda AO; Otsyina R; Filson G; Machado VS  
**Title** Indigenous miombo fruit trees - health and wealth for the Sukuma people  
**Year** 1997  
**Source title** Agroforestry Today  
**Reference** 9(3): 23-25

**Abstract**

A questionnaire survey was conducted of 91 households and 20 markets on indigenous miombo fruit trees used by the Sukuma people in Maswa District of Shinyangha Region, Tanzania, during the March-October dry season of 1995. Data are tabulated on the uses of various parts (flowers, fruits, leaves, bark, roots and stems/branches) of 10 species mentioned by at least 10% of respondents, and on the percentage of respondents owning and using the fruits of these same 10 species. *Tamarindus indica* was the most abundant and used species, followed by *Canthium burtii*, *Grewia fallax*, *Diospyros fischeri*, *Vitex payos*, *Ximenia caffra*, *Adansonia digitata*, *Vitex mombassae*, *Azanza garckeana* and *Ficus natalensis*.



**Author** Delisle H; Bakari S; Gevry G; Picard C; Ferland G  
**Title** Provitamin A content of traditional green leaves from Niger. OT: Teneur en provit  
**Year** 1997  
**Source title** Cahiers Agricultures  
**Reference** 6(8): 553-560

### **Abstract**

As part of a study on vitamin A intake of preschool children in Niger, traditional green leaves as locally processed were sampled for provitamin A determination, using HPLC (high performance liquid chromatography). A total of 168 samples from 15 plant species were collected from three different villages in western Niger, two in Bouza district and one in Ouallam district. The main species available and consumed throughout the year, supply sources, and processing methods, were identified in a preliminary study. In both districts, most women are involved in drying leaves. Dried greens are used year-round, mostly in soups served with the staple dish of millet, while fresh leaves are mainly prepared during the rainy season, either boiled or steamed with millet flour. Plant species found in both areas are usually processed similarly, but not all species were found in a given site. Samples of processed leaves were collected during the rainy season. In a given village, three different women provided by a sample of every leaf species available for every processing method used. Weighed specimens of dried or fresh cooked leaves were wrapped in opaque plastic bags, quickly frozen, and shipped to Montreal on dry ice for analysis. Provitamin A carotenoid determinations were done in duplicate with the results expressed as total provitamin A carotenoid ( $\mu\text{-g}$  of retinol equivalents RE) per 100 g. Moisture content was also determined for all samples after drying in a conventional oven for 48 to 72 h. The average provitamin A level for the 57 samples of dried leaves was  $2,273 \pm 1,152$  RE/100 g, ranging from a low of 861 in *Adansonia digitata* to a high of 3,681 in *Ceratoteca sesamoides* (Table 1). The variance was very high and significant differences were observed among plant species and collection sites. Residual moisture did not vary according to species and site, and therefore could not explain the observed differences. Fresh boiled leaves had on average  $1,333 \pm 596$  RE/100 g fresh weight, and steamed leaves  $928 \pm 526$  RE (Table 2). For fresh leaves, in addition to species and site, the cooking method was significantly associated with the provitamin A level. For the four species cooked either way (Figure 1), boiled leaves had a higher provitamin A content than steamed leaves, both on a fresh and dry weight basis, this difference could not be ascribed to cooking time. Per dry weight unit (Table 3), leaves collected in the dried state had roughly half the provitamin A content of samples cooked fresh, and steamed leaves had half as much provitamin A as boiled samples of the same species. After adjustment for the processing method, species with the highest level of provitamin A, on a dry weight basis, were *Allium cepa* (onion greens), *C. sesamoides* (false benniseed) and *Hibiscus sabdarifa* (red sorrel). Despite wide variations in the provitamin A content of green leaves, these food items can be major contributors of vitamin A for children in the study areas. Depending on the species and type of dish a small portion could provide from 11% to 104% of the safe vitamin A intake level for young children (Table 4). The study suggests that in rapid dietary assessments, fresh boiled greens should be distinguished from other green leaf dishes, in view of their provitamin A content. Based on children's food intake data, the estimated contribution of green leaves was on average two-thirds of the safe vitamin A intake level, but with a wide range. The real contribution of green leaves to vitamin A requirements may however be much lower, as the bioavailability of green leaf carotenoids is likely much lower than was assumed until recently, and as requirements may be increased in these children as a result of high exposure to infection. Elucidation of the above issues

is needed for relevant food-based strategies to be advocated for the prevention of vitamin A deficiency in tropical Africa .

**Author** Glew RH; VanderJagt DJ; Lockett C; Grivetti LE; Sm  
**Title** Amino acid, fatty acid, and mineral composition of 24 indigenous plants of Burki  
**Year** 1997  
**Source title** Journal of Food Composition and Analysis  
**Reference** 10(3): 205-217

**Abstract**

The leaves, seeds, flowers, and fruit of many indigenous plants are staples of populations who inhabit the Sahel region of Africa. They serve to supplement the nutrients provided by cereals such as millet and sorghum. However there is a lack of comprehensive compositional data regarding the nutrient content of these indigenous plants. In this report, we present nutritional data for 24 plant materials collected in Burkina Faso, including their content of amino acids, fatty acids and minerals. Three plants contained 20 to 37% protein (on a dry weight basis): *Vigna* sp., *Hibiscus esculentus*, and *Parkia biglobosa*. Relative to a WHO protein standard, three plants scored relatively high: *Voadzeiia subterranea*, *Pennisetum americanum*, and *Bixa orellana*. Plants which contained large amounts of the essential fatty acids linoleic or alpha-linolenic acid were *Vigna* sp., *Hibiscus esculentus* seeds, *Parkia biglobosa* seeds, and *Vitex doniana* fruit. Three plants were rich in iron: *Adansonia digitata* , *Bixa orellana*, and *Xylopiia* sp. The fruit and seeds of *Hibiscus esculentus* were an excellent source of zinc. The plant foods with the highest calcium content were *Adansonia digitata* leaves, *Hibiscus* sp., and *Bombax costatum*. These data show that in terms of both quality and quantity there are numerous spontaneous desert plants that can serve as significant sources of essential amino acids, essential fatty acids and trace minerals for populations living in the western Sahel .

**Author** Igboeli LC; Addy EOH; Salami LI  
**Title** Effects of some processing techniques on the antinutrient contents of baobab seed  
**Year** 1997  
**Source title** Bioresource Technology  
**Reference** 59(1): 29-31

**Abstract**

The effect of different processing techniques on the antinutritional factors inherent in the seeds of baobab (*Adansonia digitata*) was investigated. The processing methods, which included dehulling, cold-water, hot-water hot- alkali and acid treatments, revealed that the concentration of tannic acid was reduced significantly by all the processing techniques except for dehulling. The activity of the amylase inhibitors in the seeds was also reduced significantly by dehulling, cold-water and hot-alkali treatments while the hot-water and hot-acid treatments increased the activity of the amylase inhibitors .

**Author** Kemp AC; Begg KS; Benn GA; Chadwick P  
**Title** A visual assessment of vegetation structure for the Kruger National Park  
**Year** 1997  
**Source title** Koedoe  
**Reference** 40(2): 117-121  
**Abstract**

-

**Author** Thompson, C. P.  
**Title** L'aventure ambigue de la femme africaine. Une etude comparee de l'evolution de s  
**Year** 1997  
**Source title** International Comparative Literature Association; Gendered memories, Leiden, T  
**Reference** Rodopi BV Editions, 89-99 pp  
**Abstract**

-

**Author** Baum DA  
**Title** The Ecology and Conservation of the Baobabs of Madagascar  
**Year** 1996  
**Source title** Primate Report  
**Reference** 46-1  
**Abstract**

-

**Author** Bhat RB  
**Title** Leaf architecture in Adansonia, Bombax and Ceiba (Bombacaceae)  
**Year** 1996  
**Source title** Australian Systematic Botany  
**Reference** 9(2): 255-260

**Abstract**

Leaf architecture was investigated in three species of the family Bombacaceae. The mature leaflets from both fresh and herbarium materials were cleared using the method of Mohan Ram and Nayyar (1977), and terminologies of Hickey (1973) were used to determine the leaf characters and the venation patterns. The whole lamina is more or less symmetrical in all the species investigated. The major venation pattern conforms to the types of camptodromous mixed with festooned brochidodromous, and festooned brochidodromous. In all the members of the family studied, the primary and secondary veins are ornamented with parenchymatous bundle sheaths. Imperfectly developed areoles are predominant over the developed ones. The size and the shape of the areole is variable. The vein endings may be simple, or once or sometimes twice dichotomously branched. The highest venation order of the family is sixth degree. Marginal ultimate venation is looped. Tracheids are either uni-, bi-, tri-, or multi-seriate and vary in shape and size, and are commonly found at the free ends of the veins. Extension cells and isolated tracheids are not common. These characters are remarkably different from those in members of the Malvaceae.

**Author** Cao JM; Gresti J; Blond JP; Bezard J  
**Title** Effects of cyclopropenoid fatty acids (Baobab seed oil) on the fatty acid profile of  
**Year** 1996  
**Source title** Journal of Food Lipids  
**Reference** 3: 76-86

**Abstract**

**Author** Cao, J. M., J. Gresti, J. P. Blond and J. Bezard  
**Title** Effects of cyclopropenoid fatty acids (baobab seed oil) on the fatty acid profile of  
**Year** 1996  
**Source title** Journal of Food Lipids  
**Reference** 3(1): 73-86

**Abstract**

-

**Author** Eteshola E; Oraedu ACI  
**Title** Fatty acid compositions of tigernut tubers (*Cyperus esculentus* L.), baobab seeds (  
**Year** 1996  
**Source title** Journal of the American Oil Chemists Society  
**Reference** 73(2): 255-257

**Abstract**

Fatty acid profiles and iodine values of tigernut tubers (*Cyperus esculentus* L.), decorticated seeds of the baobab tree (*Adansonia digitata* L.), and their mixture (one part of tigernut to three parts of baobab seeds, w/w) were chromatographically and chemically determined. All three samples contained myristic acid as the main saturated acid and oleic acid as the predominant unsaturated acid. Linoleic acid was present in the samples to the extent of 8.8-27.4%, and no other polyunsaturated acids were found. The vegetable oil mixture had the highest level of linoleate, and its possible significance in relation to the intended use in novel food formulation is discussed.

**Author** Farah, M. O. and F. M. Harraz  
**Title** Effects of oral administration of the aqueous extract of the fruit pulp of adansonia  
**Year** 1996  
**Source title** Alexandria Journal of Pharmaceutical Sciences  
**Reference** 10(1): 11-12

**Abstract**

-

**Author** Lamien N; Sidibe A; Bayala J  
**Title** Use and Commercialization of non-timber forest products in weatern Burkina Fas  
**Year** 1996  
**Source title** Non-Wood Forest Products  
**Reference** 9: 51-63

**Abstract**

-

**Author** Nordeide MB; Hatloy A; Folling M; Lied E; Oshaug A  
**Title** Nutrient composition and nutritional importance of green leaves and wild food res  
**Year** 1996  
**Source title** International Journal of Food Sciences and Nutrition  
**Reference** 47(6): 455-468

**Abstract**

This paper discusses the nutrient composition and the nutritional importance of green leaves and wild gathered foods in an area with surplus food production in Mali. In this West African country, there is little information about the nutrient composition and the nutritional quality of foods in general, and of wild gathered foods in particular. Food frequency was collected in two cross-sectional surveys. Focus group discussions with women in the area were used to collect information about seasonality, availability and preparation of various foods. Selected food samples were collected for chemical analysis of nutrient composition. The food samples of green leaves (*Adansonia digitata*, *Amaranthus viridis*, *Tamarindus indica*, *Allium cepa*), seeds and flour (*Parkia biglobosa*) and fruits (*Tamarindus indica*) were analysed for water, energy, fat, protein, minerals, amino acids and carotenoids. Availability and use of the foods varied with seasons. In the rainy season, wild gathered foods (e.g. *A. digitata*) were used as much as fresh cultivated foods (e.g. *A. viridis* and *A. cepa*). The wild food resources were more frequently used in rural than in urban areas, with *A. digitata* as the dominating green leaves. Green leaves were rich in energy, protein and minerals (calcium, iron). Leaves of *A. viridis* were, in particular, rich in beta-carotene (3290 µg/100g). Chemical score in dried green leaves varied from 47 (*A. cepa*) to 81 (*A. digitata*), with lysine as the first limiting amino acid. *P. biglobosa* fermented seed with 35% fat and 37% protein were a complementary source of lysine in the diet. Based on the seasonality, the frequency of use and the nutrient contents of selected green leaves and wild gathered foods in Koutiala district, it is concluded that these traditional and locally produced foods are valuable and important nutrient contributors in the diet both in rural and urban areas, but most important in rural areas.

**Author** Odetokun SM  
**Title** The nutritive value of Baobab fruit (*Adansonia digitata*)  
**Year** 1996  
**Source title** Rivista Italiana delle Sostanze Grasse  
**Reference** 73(8): 371-373

**Abstract**

The seed, powdery pulp and hard husk of *Adansonia digitata* fruit was analysed. The proximate moisture contents of the seed, pulp and hard husk were 6.12 plus or minus 0.14, 6.21 plus or minus 0.02 and 3.11 plus or minus 0.17%, respectively. The husk had a proximate ash content of 4.21 plus or minus 0.31% and a crude fibre content of 35.3 plus or minus 0.47%, which were higher than those of the seed and pulp. The proximate crude protein content of the seed was 21.42 plus or minus 0.34% while that of the pulp and husk were 10.90 plus or minus 0.30 and 2.41 plus or minus 0.17%, respectively. Proline and valine were the limiting amino acids. The proximate oil content of the seed was 17.51 plus or minus 0.13%. The oil had the following physico-chemical properties: peroxide value 5.14 plus or minus 0.12, iodine value 86.41 plus or minus 0.64, acid value 7.79 plus or minus 0.33 mg/KOH g<sup>-1</sup>, saponification value 132.68 plus or minus 2.14 and free fatty acid 6.40 plus or minus 0.18. The oil contained 8 fatty acids which were composed of 82% unsaturated acids. The 5 sugars identified in the pulp were glucose, fructose, sucrose, maltose and raffinose. These sugars accounted for 43.62 plus or minus 0.17% of the carbohydrate content. Potassium and sodium were the most abundant elements in the seed, pulp and husk.

**Author** Puy B du; du Puy B  
**Title** The baobabs of Madagascar  
**Year** 1996  
**Source title** Curtis's Botanical Magazine  
**Reference** 13(2): 86-95

**Abstract**

-

**Author** Sidibe M; Scheuring JF; Tembely D; Sidibe MM; Hofm  
**Title** Baobab - homegrown vitamin C for Africa  
**Year** 1996  
**Source title** Agroforestry Today  
**Reference** 8(2): 13-15

**Abstract**

Baobab (*Adansonia digitata*) fruits were collected from 2-3 trees sampled in 3-5 villages in each of 3 regions in Mali, the pulp scraped out and separated from the seeds and fibres, and analysed for vitamin C [ascorbic acid]. There was a 3-fold variation in vitamin C content - indicating significant potential for selecting trees and clones with a high vitamin C content. The traditional grouping of baobab trees by bark colour was not useful as a means of selection, since high vitamin C contents were found in all 3 types (black, red and grey barked). The possibility of producing high vitamin C trees of baobab by grafting is discussed, and the potential importance of the tree fruit in raising nutritional standards in the region emphasize.

**Author** Smith GC; Clegg MS; Keen CL; Grivetti LE  
**Title** Mineral values of selected plant foods common to southern Burkina Faso and to N  
**Year** 1996  
**Source title** International Journal of Food Sciences and Nutrition  
**Reference** 47(1): 41-53

**Abstract**

Wild and cultivated fruits, leaves, nuts, seeds, spices and vegetables from southern Burkina Faso and Niamey, Niger, were analysed for their copper, iron, magnesium, manganese and zinc concentrations and compared to imported, exotic reference foods found within the study area. The species analysed covered a broad spectrum of local diet; 33 were wild and 16 were cultivated. The edible wild plants were often the highest in mineral concentrations. Five species analysed, exhibited consistently high mineral values, specifically, *Adansonia digitata*, *Boerhavia diffusa*, *Cerathoteca sesamoides*, *Sclerocarya birrea* and *Xylopia* sp. The latter was particularly high in zinc, an observation which suggests that there may be a solid rationale for local traditions which recommended its consumption during pregnancy and lactation. Respondents indicated that during times of drought, wild plants were not consumed in the volume they once were, due to changes of infrastructure and in famine relief programmes.



**Author** Smith GC; Dueker SR; Clifford AJ; Grivetti LE  
**Title** Carotenoid values of selected plant foods common to southern Burkina Faso, Wes  
**Year** 1996  
**Source title** Ecology of Food and Nutrition  
**Reference** 35(1): 43-58

**Abstract**

-

**Author** Addy EOH; Salami LI; Igboeli LC; Remawa HS  
**Title** Effect of processing on nutrient composition and anti-nutritive substances of Afric  
**Year** 1995  
**Source title** Plant Foods for Human Nutrition  
**Reference** 48(2): 113-117

**Abstract**

The effects of various processing techniques on nutrient composition and anti-nutritional factors in baobab seeds (*Adansonia digitata* L.) and locust beans (*Parkia filicoidea* L.) were investigated. The methods used for processing include boiling in water, acid or alkali and fermentation. Using the water treated samples as controls, there were slight decreases in protein and carbohydrate contents of the fermented and alkali-treated meals. However, an increase in extractable oil content was observed in acid alkali and fermented samples. The alkali treatment appeared to be the most effective method for reducing trypsin inhibitor and tannin contents and has the additional advantage of improving the protein digestibility. What tree is more conspicuous in West Africa's drylands than the baobab? Majestic, distinctive and extremely useful this tree has found its way into the mythology of most of the peoples who live in the savannas of Africa. But as Modibo Sidibe and others write in this article, the tree is also of great interest to researchers, who are finding it high in valuable vitamins.

**Author** Andrianaivo-Rafehivola AA; Siess MH; Gaydou EM  
**Title** Modifications of hepatic drug metabolizing enzyme activities in rats fed baobab s  
**Year** 1995  
**Source title** Food and Chemical Toxicology  
**Reference** 33(5): 377-382

**Abstract**

The effects on drug metabolizing enzymes of cyclopropenoid fatty acids present in baobab seed oil were evaluated in rats fed either a diet with baobab seed oil (1.27% cyclopropenoid fatty acids in the diet) or a diet with heated baobab seed oil (0.046% cyclopropenoid fatty acids in the diet). Comparison was made with rats fed a mixture of oils that contained no cyclopropenoid fatty acid. Rats fed baobab oil showed retarded growth. In comparison with the other groups, the relative liver weights were markedly increased whereas cytochrome P-450 content and NADPH cytochrome c reductase and NADH cytochrome c reductase activities were decreased. In rats fed the heated baobab oil the relative liver weight was decreased and the cytochrome P-450 level and reductase activities were increased relative to levels in rats fed the unheated oil. Ethoxycoumarin deethylase, ethoxyresorufin deethylase and pentoxyresorufin deethylase activities, expressed on the basis of cytochrome P-450, were greater in the group fed unheated baobab seed oil. Cytosolic glutathione transferase activity was markedly decreased in rats fed fresh baobab seed oil and heating the oil, which reduced the content of cyclopropenoid fatty acids, led to a considerable increase of this activity. UDP-glucuronyl transferase activities were not modified by the type of oil included in the diet. It is possible that the mechanisms of action of cyclopropenoid fatty acids are related to alterations of membrane lipid composition or microsomal proteins.

**Author** Baum DA  
**Title** The baobabs of Madagascar: Ecological interactions and conservation  
**Year** 1995  
**Source title** Environmental Change in Madagascar; Symposium, Chicago, Illinois, USA, June  
**Reference** Patterson BD, SM Goodman and JL Sedlock (Ed.). Field Museum of Natural Hist

**Abstract**

**Author** Baum DA  
**Title** A systematic revision of Adansonia (Bombacaceae)  
**Year** 1995  
**Source title** Annals of the Missouri Botanical Garden  
**Reference** 82(3): 440-470

**Abstract**

The baobabs (Bombacaceae: Adansonia) are tropical trees native to Africa, Australia, and Madagascar but dispersed widely by humans. The members of the genus are united by several derived characters that serve to distinguish them from other Bombacaceae, including a characteristic, indehiscent fruit with reniform seeds and a powdery pulp. The systematics of Adansonia is revised, with three sections and eight species being recognized. The support for each species is discussed in the context of the "Genealogical Species Concept." Several nomenclatural problems are resolved, and a new combination, *A. gibbosa* (A. Cunn.) Guym. ex D. Baum, is made. In addition, the ecology, ethnobotany, and conservation status of Adansonia is summarized, focusing especially on the poorly known Malagasy and Australian species.

**Author** Baum, D. A.  
**Title** The comparative pollination and floral biology of baobabs (adansonia-bombacaceae)  
**Year** 1995  
**Source title** Annals of the Missouri Botanical Garden  
**Reference** 82(2): 322

**Abstract**

-

**Author** Bhat RB  
**Title** Leaf architecture and its dynamics in the Bombacaceae  
**Year** 1995  
**Source title** Beitrage zur Biologie der Pflanzen  
**Reference** 68(2): 169-179

**Abstract**

The architecture of the leaf (leaflets) has been investigated in 3 genera and 3 species of the family Bombacaceae. The mature leaflets from both fresh and herbarium materials were cleared using the customary methods, and terminologies of Hickey (1973) are used to determine the characters of leaf architecture. The whole lamina of the leaflet is more or less symmetrical in all the species studied. The major venation pattern conforms to the camptodromous mixed with festooned brochidodromous and the festooned brochidodromous types. In all the members of the family studied, the primary and secondary veins are ornamented with parenchymatous bundle sheaths. Imperfectly developed areoles are predominant over the developed ones. The size and the shape of the areole is variable. The vein endings may be simple, once or sometimes twice dichotomously branched. The highest venation order of the family is 6 degree . Marginal ultimate venation is looped. Tracheids are either uni-, bi-, tri-, or multiseriate and vary in shape, size and are commonly found at the free vein endings. Extension cells and isolated tracheids are not common. These characters are of great taxonomic importance .

**Author** Burt, G.  
**Title** Queens of the dry forest: Madagascar's huge baobab trees, with their distended bol  
**Year** 1995  
**Source title** Landscape Design  
**Reference** 46

**Abstract**

**Author** Caplan M  
**Title** Collapsing baobabs  
**Year** 1995  
**Source title** Veld and Flora  
**Reference** 81(1): 22  
**Abstract**

-

**Author** Ganzhorn JU  
**Title** Cyclones over Madagascar: fate or fortune?  
**Year** 1995  
**Source title** Ambio  
**Reference** 24(2): 124-125  
**Abstract**

-

**Author** Locher CP; Burch MT; Mower HF; Berestecky J; Davis  
**Title** Anti-microbial activity and anti-complement activity of extracts obtained from sel  
**Year** 1995  
**Source title** Journal of Ethnopharmacology  
**Reference** 49(1): 23-32  
**Abstract**

-

**Author** Vogt K  
**Title** Adansonia digitata L  
**Year** 1995  
**Source title** A Field Worker's Guide to the Identification, Propagation and Uses of Common Tr  
**Reference** SOS Sahel International, London.  
**Abstract**

-

**Author** Ajisehiri ES; Sopade PA; Abass AB  
**Title** Moisture sorption study on Nigerian foods: Kuka  
**Year** 1994  
**Source title** Journal of Stored Products Research  
**Reference** 30(4): 331-338  
**Abstract**

-

**Author** Andrianaivorafehivola AA; Cao JM, Gaydou EE  
**Title** Effects of Fresh and heated Baobab seed oil feeding on growth, food consumption  
**Year** 1994  
**Source title** Revue Francaise des Corps Gras  
**Reference** 41(3/4): 53-59  
**Abstract**

-

**Author** Barnes RFW; Barnes KL; Kapela EB  
**Title** The long-term impact of elephant browsing on baobab trees at Msembe, Ruaha Na  
**Year** 1994  
**Source title** African Journal of Ecology  
**Reference** 32(3): 177-184  
**Abstract**

-

**Author** Baum, D. A. and K. Oginuma  
**Title** A review of chromosome numbers in bombacaceae with new counts for Adansoni  
**Year** 1994  
**Source title** Taxon  
**Reference** 43(1): 11  
**Abstract**

-

**Author** Clarke J  
**Title** Putting user's needs and preferences first: PRA methods for eliciting selection crit  
**Year** 1994  
**Source title** MAB Digests  
**Reference** 17 (Domestication of tropical trees for timber and non-timber products; Eds. R.R.  
**Abstract**

-

**Author** Danthu P; Roussel J; Gaye A; El Mazzoudi EH  
**Title** Baobab (*Adansonia digitata* L.) seed pretreatments for germination improvement  
**Year** 1994  
**Source title** Seed Science and Technology  
**Reference** 23(2): 469-475

**Abstract**

Baobab seeds (*Adansonia digitata*) have very hard seed coats and germination is usually under 20%. Treatment with concentrated sulphuric acid for six to twelve hours led to germination of more than 90% of the seeds within 20 days of sowing. Manual scarification (removal of a small fragment of integument) hastened germination, which was completed in six to eight days. However, this method could result in rapid imbibition of the seeds which led to the necrosis of 10 to 25% of the embryo. Boiling water treatment gave variable results depending on the seedlots used. While soaking in cold water was generally ineffective and was sometimes harmful after manual scarification.

**Author** Gijsbers HJM; Kessler JJ; Knevel MK  
**Title** Dynamics and natural regeneration of woody species in farmed parklands in the S  
**Year** 1994  
**Source title** Forest Ecology and Management  
**Reference** 64(1): 1-12

**Abstract**

-

**Author** Kalenga Saka JD  
**Title** The nutritional value of edible indigenous fruits: present research status and futur  
**Year** 1994  
**Source title** MAB Digests  
**Reference** 17 (Domestication of tropical trees for timber and non-timber products; Eds. R.R.

**Abstract**

-



**Author** Kwesiga F; Mwanza S  
**Title** Underexploited wild genetic resources: the case of indigenous fruit trees in easter  
**Year** 1994  
**Source title** MAB Digests  
**Reference** 17 (Domestication of tropical trees for timber and non-timber products; Eds. R.R.  
**Abstract**

-

**Author** Mateke SM; Kamara CS; Chikasa P  
**Title** Ripening periods of edible indigenous fruits in Zambia: implications for utilizatio  
**Year** 1994  
**Source title** MAB Digests  
**Reference** 17 (Domestication of tropical trees for timber and non-timber products; Eds. RRB  
**Abstract**

-

**Author** Minae S; Sambo EY; Muntali SS; Ng'ong'o  
**Title** Selecting priority indigenous fruit trees for central Malawi farmers' evaluation crit  
**Year** 1994  
**Source title** MAB Digests  
**Reference** 17 (Domestication of tropical trees for timber and non-timber products; Eds. RRB  
**Abstract**

-

**Author** Obizoba IC; Anyika JU  
**Title** Nutritive value of baobab milk (gubdi) and mixtures of baobab (*Adansonia digitata*)  
**Year** 1994  
**Source title** Plant Foods for Human Nutrition  
**Reference** 46(2): 157-165

**Abstract**

The baobab milk and fermented baobab/acha flour mixtures were analyzed chemically for their proximate, ascorbate, mineral and antinutrient composition. The dry pulp scraped from baobab fruits was kneaded, made into solution, extracted through cheese-cloth and stored frozen until analyzed. The acha and baobab grains were cleaned, fermented for 24 to 120 hours, dried and hammermilled into fine flours. The unfermented flours served as controls. The standard assay methods of AOAC were selected for use for the analysis of the nutrients and the antinutrients. The mixtures were composed of 70% acha and 30% baobab flours (70:30 protein basis). The baobab milk contained more protein (1.5%) and minerals (Fe, 17.8 mg; Ca 134.2 mg) than those of human milk (protein, 1.3%, Fe, 0.2 mg, Ca 30 mg) and cow milk (Fe, 0.1 mg; Ca 1.20 mg) and most leading national commercial infant formulas e.g. cerelac (Fe, 10.0 mg). The composite flours contained more nutrients than the baobab or the acha flour alone. The BF96 had greater advantage over other BF flours as a supplement to acha. The mixtures are within the reach of lower income group and can be incorporated into their diets.

**Author** Ramadan A; Harraz FM; El Mougy-SA  
**Title** Anti-inflammatory, analgesic and antipyretic effects of the fruit pulp of *Adansonia digitata*  
**Year** 1994  
**Source title** Fitoterapia  
**Reference** 65(5): 418-422

**Abstract**

The aqueous extract of *A. digitata* fruit pulp showed a LD-50 in mice by i.p. route of 8000 mg/kg and induced a marked and long lasting anti-inflammatory and antipyretic effects at 400 and 800 mg/kg per os in rats. The extract also showed a marked analgesic activity in mice at 2 h after administration. Phytochemical screening of the fruit pulp of the plant indicated the presence of sterols and/or triterpenes, saponins, tannins, carbohydrates and glycosides.

**Author** Rashford J  
**Title** Africa's Baobab tree: Why monkey names?  
**Year** 1994  
**Source title** Journal of Ethnobiology  
**Reference** 14(2): 173-183

**Abstract**

Monkey bread and monkey tamarind are two of the common names that appear in published accounts of Africa's well-known baobab tree (*Adansonia digitata* L.). These monkey names are generally assumed to be derived from the simple fact that monkey's eat the baobab's fruit. Although this literal interpretation seems obvious, it is neither the only one, nor is it necessarily the correct one. In the Caribbean, the use of monkey in the compound common names for the baobab and other plants implies imitation. The monkey tamarind, for example, indicates that the baobab is like the tamarind tree (*Tamarindus indica* L.). It mimics the tamarind just as a monkey does a human. This is consistent with what we find in other parts of the world where the baobab is also identified as a kind of tamarind, though without the name monkey.

**Author** Salami LI; Okezie UN  
**Title** The nutritional composition and storage stability of millet (*Pennisetum americanu*  
**Year** 1994  
**Source title** Ecology of Food and Nutrition  
**Reference** 31(3-4): 211-218

**Abstract**

-

**Author** Tengecho B  
**Title** Distribution and occurrence of some cotton stainers (Heteroptera: Insecta) on diff  
**Year** 1994  
**Source title** Insect Science and its Application  
**Reference** 15(1): 49-54

**Abstract**

-

**Author** Vale GA; Wilcox J; Abson J  
**Title** Prospects for using odour-baited trees to control tsetse flies (Diptera: Glossinidae)  
**Year** 1994  
**Source title** Bulletin of Entomological Research  
**Reference** 84(1): 123-130  
**Abstract**

-

**Author** Yazzie, D., D. J. VanderJagt, A. Pastuszyn and A. Okolo  
**Title** The amino acid and mineral content of baobab (*adansonia digitata* l.) leaves  
**Year** 1994  
**Source title** Journal of Food Composition and Analysis  
**Reference** 7(3): 189  
**Abstract**

-

**Author** Andrianaivorafehivola AA; Blond JP; Cao JM  
**Title** Influence of cyclopropene fatty-acids (baobab seed oil) feeding on the in vitro delt  
**Year** 1993  
**Source title** Journal of Nutritional Biochemistry  
**Reference** 4(2): 92-96  
**Abstract**

-

**Author** Anonymous  
**Title** Special issue: trees of the month. OT: Special arbres du mois  
**Year** 1993  
**Source title** Flamboyant  
**Reference** 27: 4-39  
**Abstract**

-

**Author** Belsky AJ; Mwonga SM; Amundson RG; Duxbury JM; Ali  
**Title** Comparative effects of isolated trees on their undercanopy environments in high-  
**Year** 1993  
**Source title** Journal of Applied Ecology  
**Reference** 30(1): 143-155  
**Abstract**

-

**Author** Belsky AJ; Mwonga SM; Duxbury JM  
**Title** Effects of widely spaced trees and livestock grazing on understory environments i  
**Year** 1993  
**Source title** Agroforestry Systems  
**Reference** 24(1): 1-20  
**Abstract**

-

**Author** Cao JM; Blond JP; Bezard J  
**Title** Inhibition of Fatty acids delta 6 and delta 5 - desaturation by cyclopropene fatty ac  
**Year** 1993  
**Source title** Biochimica et Biophysica Acta  
**Reference** 1210: 27-34  
**Abstract**

-

**Author** Dupriez H; Leener P de; De Leener P  
**Title** Trees and multi-storied agricultural systems of Africa  
**Year** 1993  
**Source title** Arbres et agricultures multietagees d'Afrique  
**Reference** 280 pp.  
**Abstract**

-

**Author** Marz U  
**Title** The optimum composition of tree and shrub species for afforestation measures in  
**Year** 1993  
**Source title** Tropenlandwirt  
**Reference** 94(October): 175-183  
**Abstract**

-

**Author** Obizoba, I. C. and N. A. Amaechi  
**Title** The effect of processing methods on the chemical composition of baobab (adanso  
**Year** 1993  
**Source title** Ecology of Food and Nutrition  
**Reference** 29(3): 199

**Abstract**

-

**Author** Prentice A; Laskey MA; Shaw J; Hudson GJ; Day KC  
**Title** The calcium and phosphorous intakes of rural Gambian women during pregnancy  
**Year** 1993  
**Source title** British Journal of Nutrition  
**Reference** 69(3): 885-896

**Abstract**

The Ca and P intakes of 148 pregnant and lactating women in a rural village in The Gambia, West Africa, have been estimated by direct weighing of food on a total of 4188 d. The Ca and P contents of local foods were determined by analysis of raw ingredients, snack foods and prepared dishes. Information about the contribution of mineral-rich seasonings was obtained. Efforts were made to discover unusual sources of Ca that might not be perceived as food by subject or observer. The main contributors to daily Ca intake were shown to be leaves, fish, cereals, groundnuts and local salt. Cow's milk accounted for only 5 % of Ca intake. Unusual sources of Ca were discovered, namely baobab (*Adansonia digitata*) fruit and selected earths, but these were consumed infrequently and their contributions to Ca intakes were small. Cereals and groundnuts were the main sources of P. Ca and P intakes (mg/d) were shown to average 404 (SD 110) and 887 (SD 219) respectively. Seasonal changes in the availability of leaves, cereals and groundnuts resulted in variations in Ca and P intakes. The rainy season was associated with increased Ca intakes (by 16 %) but decreased P consumption (by 15 %). No difference was observed in Ca intake between pregnant and lactating women but P intake in lactation was 11 % higher than that in pregnancy during the post-harvest season. The implications of these low Ca intakes require investigation.

**Author** Sissoko K; Soumare S; Soumare A  
**Title** Woody species, a trump to protect. OT: Les especes ligneuses, un atout a preserve  
**Year** 1993  
**Source title** Lettre du Reseau Recherche Developpement  
**Reference** 19: 4-7, GRET, Ministere de la Cooperation; Paris; France

**Abstract**

A socioeconomic survey of farmer preferences for tree species was carried out in five villages (124 persons were interviewed, representing all farming families in the area) near Niono, Mali, in 1990. The survey formed part of an agroforestry project which aims to improve crop yields and increase forage supply in the region. Data were collected on ethnic group, family size, livestock, farming practices, and preferences for indigenous or exotic tree species; they included a field inventory of trees. Twenty-eight tree species were identified in the field, and these are considered in three groups: (1) the most common species, which also tended to be the most highly valued, often multipurpose trees ( more than 100 individuals counted, found on 31-74% of land holdings) - in descending numerical order, *Sclerocarya birrea*, *Adansonia digitata*, *Acacia albida* [*Faidherbia albida*] and *Combretum galazense* [*Combretum gazalense*]; (2) less common (found on 10-18% of holdings), but still considered important - *Vitellaria paradoxa* [*Vitellaria paradoxa*], *Anogeissus leiocarpus*, *Cordyla pennata* [*Cordyla africana*], *Balanites aegyptiaca*, *Tamarindus indica* and *Diospyros mespiliformis*; and (3) rare (1-14 individuals), found on only 1-4% of holdings. Provision of foliage for human and/or animal consumption (e.g. *Adansonia digitata* and *T. indica*) was considered one of the most important and valued features of trees by respondents. Other uses included; fruit and oil seed production (for animal or human consumption, for processing, or for medicinal use); timber (*Piliostigma reticulatum* [*Bauhinia reticulata*], *Terminalia avicennioides*, *Commiphora africana*); and fuelwood or charcoal production (*Anogeissus leiocarpus*, *B. reticulata*, *T. avicennioides*, *Cardenalia ternifolia* [*Gardenia ternifolia*], *Entada africana* and *Pterocarpus erinaceus*). The survey suggested that fruit-producing trees would be the most suitable indigenous species to consider for development; for introduced species, priority should be given to those that enhance soil fertility, a n d / o r f o r a g e s p e c i e s .

Other species: *Commiphora africana*, *Vitellaria paradoxa*, *Anogeissus leiocarpus*, *Cordyla africana*, *Balanites aegyptiaca*, *Diospyros mespiliformis*, *Entada africana*, *Pterocarpus erinaceus*, *Sclerocarya b i r r e a* .



**Author** Swanepoel CM  
**Title** Baobab damage in Mana-Pools National Park, Zimbabwe  
**Year** 1993  
**Source title** African Journal of Ecology  
**Reference** 31(3): 220-225  
**Abstract**

-

**Author** Swanepoel CM  
**Title** Baobab phenology and growth in the Zambezi Valley, Zimbabwe  
**Year** 1993  
**Source title** African Journal of Ecology  
**Reference** 31(1): 84-86  
**Abstract**

-

**Author** Swanepoel, C. M.  
**Title** Baobab damage in mana pool national park, zimbabwe  
**Year** 1993  
**Source title** African Journal of Ecology  
**Reference** 31(3): 220  
**Abstract**

-

**Author** Alexandre DY  
**Title** Woody geophytes of the Soudanian zone: an adaptation to shallow soils. Original  
**Year** 1992  
**Source title** Flamboyant  
**Reference** 21: 27-28  
**Abstract**

-

**Author** Belsky AJ  
**Title** Effects of trees on nutritional quality of understorey gramineous forage in tropical  
**Year** 1992  
**Source title** Tropical Grasslands  
**Reference** 26(1): 12-20  
**Abstract**

-

**Author** Fussel J  
**Title** Adoption of agroclimatograms for assisting species selection in the tropics  
**Year** 1992  
**Source title** Agroforestry Systems  
**Reference** 17(2): 87-96  
**Abstract**

-

**Author** Ganzhorn JU; Bittner A  
**Title** Case study on integrated utilization of dry forests. OT: Fallstudie zur integrierten  
**Year** 1992  
**Source title** Madagaskar Mensch und Natur im Konflikt  
**Reference** 183-190  
**Abstract**

-

**Author** Hussain HSN; Deeni YY  
**Title** Plants in Kano ethnomedicine; screening for antimicrobial activity and alkaloids  
**Year** 1992  
**Source title** International Journal of Pharmacognosy  
**Reference** 29(1): 51-56  
**Abstract**

-

**Author** Milimo PB; Dick J McP; Munro RC  
**Title** Domestication of trees in semi-arid East Africa: the current situation  
**Year** 1992  
**Source title** Tropical trees: the potential for domestication and the rebuilding of forest resourc  
**Reference** RRB Leakey & AC Newton (Eds.), ITE Symposium No. 29, ECTF Symposium N  
**Abstract**

-

**Author** Nouvellet Y  
**Title** Trees at the centre of life in Fara-Poura, Burkina Faso. OT: L'arbre au centre de la  
**Year** 1992  
**Source title** Flamboyant  
**Reference** 21: 9-13  
**Abstract**

-

**Author** Ramesh D; Dennis TJ; Shingare MS  
**Title** Constituents of Adansonia digitata root bark  
**Year** 1992  
**Source title** Fitoterapia  
**Reference** 63(3): 278-279  
**Abstract**

-

**Author** Saka JDK; Msonthi JD; Sambo EY  
**Title** Dry matter, acidity and ascorbic acid contents of edible wild fruits growing in Mal  
**Year** 1992  
**Source title** Tropical Science  
**Reference** 32(3): 217-221  
**Abstract**

-

**Author** Coleman DC; Edwards AL; Belsky AJ; Mwonga S  
**Title** The distribution and abundance of soil nematodes in East African savannas  
**Year** 1991  
**Source title** Biology and Fertility of Soils  
**Reference** 12(1): 67-722

**Abstract**

-

**Author** Eromosele IC; Eromosele CO; Kuzhkuzha DM  
**Title** Evaluation of mineral elements and ascorbic acid contents in fruits of some wild p  
**Year** 1991  
**Source title** Plant Foods for Human Nutrition  
**Reference** 41(2): 151-154

**Abstract**

Ascorbic acid and mineral contents were determined in the mesocarps of 14 wild fruits of Nigeria. Data are tabulated for *Ziziphus spina[-]christi*, *Sclerocarya birrea*, *Haematostaphis berteri* [*H. barteri*], *Ximenia americana*, *Adansonia digitata*, *Annona senegalensis*, *Butyrospermum parkii* [*Vitellaria paradoxa*], *Zizyphus* [*Ziziphus*] *mauritiana*, *Phoenix dactylifera* [date], *Balanites aegyptiaca*, *Tamarindus indica* [tamarind], *Deterium* [*Detarium*] *microcarpum*, *Vitex doniana* and *Dialium guineense*. Concentrations of ascorbic acid in fruit samples were in the range 1.28 to 403.3 g/100 mg FW. *Sclerocarya birrea* and *Adansonia digitata* had concentrations of 403.3 and 337.0 mg ascorbic acid/100 g, respectively. These 2 fruits are used, respectively, as sweeteners for many local foods and as curdling agents for milk. *Zizyphus mauritiana* contained the highest concentrations of Mg, at 227.0 mg/100 g. Values for P in the fruits were in the range 5 to 28 mg/100 g, which compare with values for P in bananas of 26 mg/100 g. Fe concentrations were in the range 1.07-6.30 mg/100 g, which are 2-5 times higher than the concentrations in oranges (0.2 mg/100 g) and mangoes (0.4 m g / 1 0 0 g ) .

**Author** Esenowo GJ  
**Title** Studies on germination of Adansonia digitata seeds  
**Year** 1991  
**Source title** Journal of Agricultural Science  
**Reference** 117(1): 81-84  
**Abstract**

-

**Author** Fall ST  
**Title** In vitro digestibility and degradability in situ in the rumen of woody forage available  
**Year** 1991  
**Source title** Revue d'Elevage et de Medecine Veterinaire des Pays Tropicaux  
**Reference** 44(3): 345-354  
**Abstract**

-

**Author** Felber R; Diallo OI  
**Title** A research programme in peasant forestry in southern Mali: details and preliminary results  
**Year** 1991  
**Source title** Schweizerische Zeitschrift für Forstwesen  
**Reference** 142(12): 983-998  
**Abstract**

-

**Author** Goudet JP  
**Title** Wood and non-wood tree products [in sub-saharan Africa]. OT: Les productions a  
**Year** 1991  
**Source title** Savanes d'Afrique, terres fertiles? Proceedings of a conference held at Montpellie  
**Reference** Paris; Ministere de la Cooperation et du Developpement, 195-214 pp  
**Abstract**

-

**Author** Guinko S; Pasgo LJ  
**Title** Harvest and trade of non-wood products of local forest species in Zitenga Depart  
**Year** 1991  
**Source title** Revue Forestiere Francaise  
**Reference** 6(6): 125-130  
**Abstract**

-

**Author** Vale GA  
**Title** Responses of tsetse flies (Diptera: Glossinidae) to odour-baited trees  
**Year** 1991  
**Source title** Bulletin of Entomological Research  
**Reference** 81(3): 323-331  
**Abstract**

-

**Author** Chundawat BS  
**Title** Baobab  
**Year** 1990  
**Source title** Arid Fruit Culture  
**Reference** B. S. Chundawat (Ed.) New Delhi: Oxford and IBH Publishing.  
**Abstract**

-

**Author** Some LM; Sary H; Bellefontaine R  
**Title** Cold chamber storage of seeds of six Sahelo-Sudanese tree species. OT: Conserva  
**Year** 1990  
**Source title** Bois et Forets des Tropiques  
**Reference** 225: 42-46  
**Abstract**

-

**Author** Strang RM  
**Title** The Baobab Tree  
**Year** 1990  
**Source title** Forestry Chronicle  
**Reference** 66(4): 324  
**Abstract**

-