



## *Detarium microcarpum*

### Sweet detar



© A. KOUYATÉ

A three-year old plantation in southern Mali

#### Common name

Sweet detar, sweet dattock (English)  
Petit détár, détár sucré (French)

#### Scientific name

*Detarium microcarpum*  
Guill. and Perr.

#### Synonyms

*Detarium chevalieri* Harms.

#### Family

Fabaceae

#### Subfamily

Caesalpinioideae

#### Amadou Malé KOUYATÉ

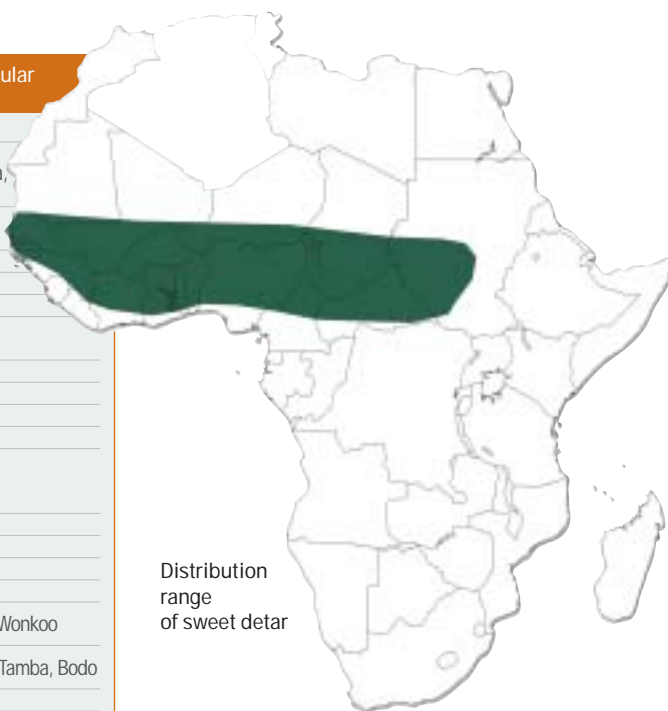
Institut d'Economie Rurale  
BP 16, Sikasso, Mali

#### Niéyidouba LAMIEN

INERA, Centre Régional de Recherches  
Environnementales et Agricoles, BP 10,  
Koudougou, Burkina Faso

This leaflet highlights the nutritional and socio-economic potential of sweet detar and provides information to assist those working with the species. The focus is on conserving genetic diversity and promoting sustainable use of sweet detar. The leaflet presents a synthesis of current knowledge about the species. The recommendations provided should be regarded as a starting point, to be further developed according to local or regional conditions. These guidelines will be updated as new information becomes available.

Socio-cultural group	Country	Vernacular name
Arabic	Sudan	Abu leile
Bambara	Mali	Ntamanjalen, tambacoumba, tambadala
Bariba	Togo, Benin	Bererou, Becemou
Bassa		Limuk
Bassari	Togo, Benin	Napuhuri
Bobofing	Burkina Faso	Pondu
Bwa	Mali, Burkina Faso	O'O
Dogon	Mali	Ponu
Ewondo	Cameroon	Amuk
Fang	Gabon	Aboranzork
Fon	Togo, Benin	Dakpa
Fulbe	Mali, Guinea, Niger, Senegal, Chad	Döli, konkéhi, kukehy, pompodogo
Haoussa	Niger, Nigeria	Taura, Taoura
Igbo	Nigeria	Ofo
Kanuri	Nigeria	Gatapo
Laka	Chad	Kutu
Malinke	Senegal, Gambia	Sarawonkoo, Wonkoo
Malinke, Mandingue	Mali, Guinea	Tamba guelu, Tamba, Bodo
Minianka	Mali	Sumparaka
Moore	Burkina Faso	Kaga
Ouobe	Côte d'Ivoire	Zama
Senoufo	Mali	Simfarga, Batio, cebaraga, tiparaga
Sérére	Senegal	Ndanh, rahn
Socé		Vonko
Soninke	Mali, Senegal	Tambacounba
Sonrai	Mali, Niger	Fantu
Wolof	Senegal	Daha, dák, danha, dank, dâx
Yacoba		Bidieu
Yoruba	Nigeria	Ogbogbo
Zarma	Niger	Fantu



Distribution range of sweet detar

wood and charcoal. A variety of food, medicinal and other products are obtained from various parts of the tree.

Fruit production is seasonal and consumed in large amounts in the dry hot season. It is an important source of nutrition during the year when other foods are less available. The fruit is rich in vitamin C.

The fruit may be eaten raw or cooked, but traditionally, the pulp is transformed into flour used in the preparation of cakes, bread, couscous, baby food and local beer. Seed kernels are added to egusi soup (generic name for seeds of some Cucurbitaceae species) or are cooked and

## Geographical distribution

The natural distribution of sweet detar extends throughout arid sub-Saharan Africa from Senegal east to Sudan. The range includes Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Niger, Nigeria, Senegal and Sudan.

## Importance and use

The wood is attractive and good for construction and carpentry. It also makes high-quality fuel

Uses	Part of plant
Fodder	Fruit (pulp), seed, leaf, flower
Fuel or building timber	Leaf
Medicine	Wood
Soap	Leaf, root, bark, fruit, seed
Bio-insecticide (mosquito)	Bark, root
Veterinary medicine	Leaf, root
Incense	Root



© A. KOUVATE

Sweet detar used as firewood

eaten as a vegetable. The leaves are used as a condiment, as are the flowers, and as a vegetable.

The scented seeds are transformed into hip collars (loose belts) that are very much appreciated by West African women.

## Socio-economic value

No statistics are available for international trading in sweet detar.

Women are the main actors in local markets. As with other products harvested from uncultivated trees, the selling price of fruit is very low. Fruit is



© A. KOUVATE

Dried pulp and collars made from sweet detar fruits

sold by intermediaries in regional markets. Firewood is also sold locally and hip collars and beads made from the dried seeds are traded internationally on an informal basis.

## Ecology and biology

Sweet detar is irregularly distributed across semi-arid areas in the Sahelian and Sudanian agro-ecological zones. It is very common locally in wooded savannahs; shrub savannahs and semi-cleared dry forest areas and is one of the most abundant species in fallows. Generally, it grows in sandy or hard soils with high iron content and in the presence of mycorrhizal fungi.



© A. KOUVATE

Sweet detar tree conserved in parkland

The main accompanying species are *Monotes kerstingii*, shea butter tree (*Vitellaria paradoxa*), wild grape (*Lannea microcarpa*), doka (*Isobertlinia doka*), African copaiba balsam tree (*Daniellia oliveri*), kokorube (*Combretum glutinosum*), four-leaved bushwillow (*Combretum ghasalense*), wild seringa (*Burkea africana*), African rosewood (*Pterocarpus erinaceus*), African mesquite (*Prosopis africana*), wild custard-apple (*Annona senegalensis*), red-flowered silk cotton tree (*Bombax costatum*) and snake bean (*Swartzia madagascariensis*).

### Reproductive biology

Sweet detar flowers are hermaphroditic, i.e. both male and female. Flowers are small, with white and cream-coloured stamens but no petals, and grow in compact clusters of 3 to 60 flowers. The flowers are pollinated by insects. The main insect visitors are beetles, wasps and flies. The seeds are dispersed mainly by humans, monkeys, rodents and parrots.

### Phenology

Sweet detar is deciduous and drops its leaves during the dry season. Timing of leaf fall varies from September to November. Leaves flush before the rainy season begins. Flowering occurs during the rainy season from July to September in the Sudanian zone and from July to November in the Sahelian zone. Each tree generally flowers for a period of about eight days. Fruit develops between the beginning of the fresh dry season (January), and the beginning of the rainy season (May). The fruits ripen between January and April. Trees often produce seedless fruits.

### Related species

The *Detarium* genus includes two other species apart from *D. microcarpum*: *D. macrocarpum* and *D. senegalense*. Both species are found in the Guineo-Congolese wet tropical forest. *Detarium senegalense* also occurs in the wetter zones of the savannahs, where it may be difficult to distinguish from sweet detar.

### Morphological traits and their variation

Sweet detar is a shrub or small tree, growing to 5–10 m tall. It has compound leaves with 3-6 pairs of leaflets. Leaves are rounded, with a notch at the leaf-tip. Trees differ morphologically, biochemically (content of vitamin C and proteins in fruit) and in their phenology (duration of



Differences in fruit shape



Elliptic fruit shape



Biconvex fruit shape

leafless period varies in different regions). In Mali, for example, fruit length and width are highly variable. Fruits in the southern Sudanian zone are significantly sweeter than those from the northern Sudanian zone. Protein content, dry-matter per unit volume and sugar content are all lower in large fruit than in small fruit.

The morphological descriptors that best describe differences between populations are



leaf length, endocarp shape, seed shape, pulp thickness, leaf length, leaf width, leaf area and the number of leaves. Large trees with high basal branches, very wide leaves, long and heavy fruit and heavy seeds are typical in the Sahelian zone, while trees with small circumference and fruit with very thick pulp are typical in the northern Sudanian zone. Trees from the southern Sudanian zone are characterized by long leaves and very large fruit. The number of leaves has been reported to be inversely proportional to the pulp thickness.

## Genetic knowledge

Provenance tests have been established by INERA (Burkina Faso) and IER (Mali) to evaluate genetic variation in growth and productivity traits but no results have been published to date. No genetic diversity studies have been reported in the literature.

## Local practices

The species is most often found on relatively poor soils and farmers sometimes take its abundance as a sign of unproductive land. Tree bark colour is considered to indicate the fertility of the land: black bark means poor land while red bark means fertile land.

The collection of fruits is not traditionally regulated. Wood is harvested during the dry season at 10-30 cm above ground level. Vegetative propagation by coppice regeneration and root suckering is well known and used by rural populations.

Beliefs and practices regarding the species differ among ethnic groups. The Minianka ethnic group, for example, wait for sweet detar to flower before sowing groundnut (*Vigna subterranea*). Branches are placed in the fields as protection against thieves but are also considered to be good fertilizer. The Bobofing ethnic group in southern Mali considers the species to be an

essential component of ritual masks used in ceremonies at the beginning of the rainy season to beg the gods for abundant rainfall.

## Threats

The main threats for sweet detar are overharvesting for wood, mainly for fuel, expansion and intensification of agriculture, and uncontrolled fires that prevent regeneration. It is unusual now to find trees with a trunk greater than 30 cm in diameter within 10 km of villages.



Exploitation of sweet detar for firewood

© A. KOUWATE

## Conservation status

Seed is orthodox and is stored in seed banks in Mali and Burkina Faso. It is not known whether the species is present in any protected areas. The species is not protected by forest legislation but is protected informally because of its value to people in several areas and countries, including eastern Mali, the provinces of Sanmatenga and Zoundweogo of Burkina Faso, Casamance in Senegal, and in Gambia and Sierra Leone.

Like other species having agroforestry value, the best strategy for conservation may be to encourage its use, including a process of well-planned domestication.

## Management and improvement



© A. KOUWATE



© A. KOUWATE

Natural regeneration

## Selection and domestication

Sweet detar is not planted by farmers, so the only form of selection or improvement that the species has undergone is the farmers' practice of leaving desirable trees in fields and removing those that do not have desired qualities.

Farmers commonly prune basal branches to stimulate fruit production, reduce shade on crops and to provide fodder for livestock. A number of ethnobotanical, morphological, biochemical and phenological characterization studies have provided discriminating descriptors and farmer selection criteria that could be used by future genetic improvement programmes.

## Propagation from seed

Nursery production of seedlings is easy. Seeds are orthodox so can be stored after collection in jute bags at ambient temperature for up to five years. Seed must be scarified to break dormancy before they are planted in a compost-based substrate. Seeds are scarified by immersing them briefly in boiling water or in sulphuric acid, then soaking them in tepid water for 24 hours or by nicking the hard seed coat using a sharp object.

## Vegetative propagation

The species has a great capacity of vegetative propagation by coppice regeneration and suckering from stumps or roots. It can also be propagated by rooted cuttings and grafted using scions from mature trees.

## Guidelines for conservation and use

The morphological variation observed in sweet detar would allow development of a selection and breeding programme, which would promote the conservation and sustainable use of the species.

Local knowledge is an essential element in the selection of trees and populations.



© A. KOUVATE

A mature tree partially pruned in a parkland

Provenance trials should be established throughout the species' range. A list of descriptors should be established and validated.

Regulating the exploitation for wood, controlling fires, reducing fuel-wood demand and encouraging afforestation are urgently needed. Rural communities must be helped to develop sustainable use and conservation practices for the species, particularly during periods of food shortage.

### Research needs

- Determine medicinal, nutritional and wood-energy properties, and identify market chains for these and other products
- Develop methods for regeneration and vegetative propagation
- Determine the number of viable populations in protected natural areas such as national parks
- Determine genetic variation in drought tolerance and location of important sources of variation
- Determine genetic variation in tree growth and fruit production
- Identify pollinator species, investigate effective pollen flow and determine threats to pollinator species
- Investigate effectiveness of seed dispersal and degree of dependence on fauna that are rare or threatened
- Determine effective population sizes in semi-natural farmland populations and minimum viable populations for conservation and long-term sustainable use. ■





## *Detarium microcarpum* Sweet detar

### Bibliography

This leaflet was produced by members of the SAFORGEN Food Tree Species Working Group. The objective of the working group is to encourage collaboration among experts and researchers in order to promote sustainable use and conservation of the valuable food tree species of sub-Saharan Africa.

#### Coordination committee:

Dolores Agúndez (INIA, Espagne)  
Oscar Eyog-Matig (Bioversity International)  
Niéyidouba Lamien (INERA, Burkina Faso)  
Lolona Ramamonjisoa (SNGF, Madagascar)

#### Citation:

Kouyaté AM and Lamien N 2011.  
*Detarium microcarpum*, sweet detar.  
Conservation and Sustainable Use of  
Genetic Resources of Priority Food Tree  
Species in sub-Saharan Africa.  
Bioversity International (Rome, Italy).

- Cavin AL. 2007. Contribution à la connaissance taxonomique et chimique de fruits africains du genre *Detarium* (Fabaceae–Caesalpinioideae): *D. microcarpum* Guill. et Perr. et des formes comestibles et toxiques de *D. senegalense* J.F. Gmel. Thèse de Doctorat. Université de Genève, Suisse. 277 pp.
- Kouyaté AM. 2005. Aspects ethnobotaniques et étude de la variabilité morphologique, biochimique et phénologique de *Detarium microcarpum* Guill. & Perr. au Mali. Thèse de Doctorat. Faculté des Sciences Biologiques Appliquées, Université de Gand, Belgique. 207 pp.
- Kouyaté AM and van Damme P. 2006. *Detarium microcarpum* Guill. & Perr. [online]. Record from Protabase. Schmelzer GH and Gurib-Fakim A, editors. PROTA (Plant Resources of Tropical Africa/Ressources végétales de l'Afrique tropicale), Wageningen, The Netherlands. Available at: <http://database.prota.org/se arch.htm>. Accessed 18 February 2010.
- Kouyaté AM, van Damme P, de Meulenaer B and Diawara H. 2009. Contribution des produits de cueillette dans l'alimentation humaine. Cas de *Detarium microcarpum*. *Afrika Focus* 22(1):77–88.
- Ky-Dembele C, Tigabu M, Bayala J, Ouédraogo JS and Odén PC. 2008. Comparison between clonal and sexual plantlets of *Detarium microcarpum* Guill. & Perr., a savanna tree species in Burkina Faso. *African Journal of Ecology* 46(4):602–611.
- Vautier H, Sanon M and Sacande M. 2007. *Detarium microcarpum* Guill. & Perr. Seed Leaflet 122. Forest & Landscape Denmark, Hørsholm, Denmark. Available at: <http://en.sl.life.ku.dk/upload/122net.pdf>. Accessed 18 February 2010.

ISBN: 978-84-694-3166-5

