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Bombax costatum Pellegr. & Vuillet

Protologue

Notul. Syst. (Paris) 3: 88 (1914).
[show more data \(3\)](#) [comments \(0\)](#)

Family

Bombacaceae (APG); Malvaceae)
[show more data \(11\)](#) [comments \(0\)](#)

Chromosome number

$2n = 72$
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Synonyms

Bombax andrieuxii Pellegr. & Vuillet (1914), *Bombax houardii* Pellegr. & Vuillet (1914).
[show more data \(7\)](#) [comments \(0\)](#)

Vernacular names

Red-flowered silk-cotton tree, red kapok tree, Gambia silk-cotton tree (En). Kapokier à fleurs rouges, fromager, kapokier rouge, faux kapokier, kapokier de forêt (Fr). Poilão foro, polóm fidalgo, polóm fóro, sumaturna (Po).
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Origin and geographic distribution

Bombax costatum occurs from Senegal eastward to Cameroon, southern Chad and the Central African Republic.
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Uses

The white floss present in large amounts in the fruit is widely used for stuffing mattresses, pillows and cushions. The wood has acoustic properties making it suitable for sound boxes of drums and xylophones. It is also used for making match-sticks, domestic appliances and door and window frames, and as fuelwood. Long boles are made into dug-out canoes. The bark is used for making whistles. In Sierra Leone stakes are planted to establish live fences. The bark contains tannins and yields a brown dye. In Burkina Faso the bark is used for staining the teeth red. The flowers are widely collected for the fleshy calyx which is cooked and eaten as a vegetable. The leaves too, are used as a vegetable. The unripe fruit and sometimes the flowers are added to sauces to thicken them. The young, unripe fruit is also used in the preparation of a beverage. Flowers and leaves are valuable fodder for domestic animals, while the tree provides shade for grazing animals. The seed oil is suitable for consumption. The flowers are important as bee forage. Several parts of the tree are used in traditional medicine against a great variety of illnesses. A maceration of the powdered root is eaten in a sauce or applied as a bath against epilepsy. Bark preparations are applied to wounds to promote healing. In Senegal and Sierra Leone diuretic properties are attributed to the bark of stem and roots. The bark is also used to prepare a medicine against trichomoniasis, amoebiasis and other forms of dysentery. A bath in an extract of the stem bark is taken against insanity. The powdered stem bark enters into a medicine applied as fumigation against headache. For the treatment of headache or toothache a compress of the bark may be tied on the head. The bark is also used for the treatment of skin diseases. In Mali a decoction of the bark and leaves and parts of other plants is taken against menstrual problems. The leaves are emollient and a warm bath in a decoction of the leaves may be prescribed to feverish patients, especially children. The leaves also enter into treatments of hookworm and the flowers against taenia. In Senegal the leaves are prescribed with other drug plants for the treatment of leucorrhoea and diarrhoea. An extract of the ground leaves is drunk against problems during childbirth. A bath in an extract of the ground leaves is taken repeatedly against convulsions. A tea of dried leaves is drunk or applied to the body against measles. A decoction of the leaves and the root or stem bark is drunk in serious cases of oedema. A decoction of the leaves and young twigs is drunk for the treatment of jaundice. A decoction of the leaves is also given to children to drink against rickets. Various plant parts are used for promoting lactation and as a tonic against fatigue. Leaves mixed with shea butter are rubbed onto affected skin against leprosy. In traditional veterinary medicine, leaves ground in water are given to sheep bitten by a snake. In Burkina Faso, a maceration of pounded leaves is given to animals with a retained placenta. In Niger a cold decoction of leaves and twigs is given to animals with piles.
[show more data \(3\)](#) [comments \(0\)](#)

Production and international trade

Kapok from *Bombax costatum* and other *Bombax* spp. was formerly exported from francophone West Africa; about 1000 t of kapok were exported annually. Nowadays the fibre and other products are only used and traded locally.
[show more data \(0\)](#) [comments \(0\)](#)

Properties

Little information on the properties of the kapok of *Bombax costatum* is available. The fibre cannot be spun. For most purposes, kapok of *Ceiba pentandra* (L.) Gaertn. is considered superior. The wood is pale yellow to whitish with an orange lustre when newly felled, but soon turns grey when exposed to sunlight. The heartwood is not clearly demarcated from the sapwood. The wood is lightweight, with a density of 380–500 kg/m³ at 12% moisture content. It seasons well and is not liable to major warping or shrinkage. The rates of shrinkage from green to oven dry are 2.7–3.3% radial and 5.1–6.2% tangential. The wood is soft. At 12% moisture content, the modulus of rupture is 61–71 N/mm², modulus of elasticity 4500–5400 N/mm², compression parallel to grain 23–31 N/mm², shear 3–4 N/mm², cleavage 8 N/mm and Chalais-Meudon side hardness 1.0–1.3. The wood is easy to work. Untreated wood is rapidly attacked and destroyed by fungi and insects. In Niger the fruit was found to contain 20–25% protein. The seeds have a high oil content (20%). The fatty acid composition of the oil is: caproic acid 3%, caprylic acid 7%, palmitic acid 8%, stearic acid 3%, oleic acid 49%, linoleic acid 13%, rachidic acid 3%, lignoceric acid 1–2%, and others 13%. The mucilaginous extract from the flowers is made up mainly of the sugars rhamnose and arabinose; it is a suitable adhesive for making particle board. Preliminary observations in Senegal indicate that the feed value of the leaves in ruminants is better than average with an in-vitro dry matter digestibility of 66%. The root and stem bark have shown molluscicidal activity against *Bulinus globulosus*.
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Adulterations and substitutes

Bombax buonoepense P.Beauv. is used for similar purposes as *Bombax costatum*. The fruit floss of the true kapok tree, *Ceiba pentandra*, is superior to that of *Bombax costatum* and other *Bombax* species.
[show more data \(0\)](#) [comments \(0\)](#)

Description

Deciduous, small tree 3–15(–30) m tall; bole straight, up to 60(–100) cm in diameter, sometimes buttressed; outer bark thick, rough, corky, greyish brown, covered with conical pointed spines when young, inner bark pale red-brown; crown storeyed in young trees, later irregular, spreading and sturdy; branchlets stellate hairy. Leaves palmately compound with 5–7 leaflets; stipules falling early; petiole 10–18 cm long; petiolules up to 5 mm long; leaflets obovate, 8–16 cm × 4–6 cm, base decurrent, apex long acuminate, margin entire, both surfaces glabrous, lateral veins in 8–13 pairs. Flowers solitary, bisexual, 4.5–7 cm long; pedicel 1–1.5 cm long; calyx cup-shaped, 12–17 mm long, truncate, 5-toothed; petals 5, oblong-linear, 4–6.5 cm × c. 1.5 cm, apex rounded, red to orange, rarely yellow; stamens up to 200, in bundles, up to 4 cm long; ovary conical, 5-angled, style glabrous, stigma lobed, spreading. Fruit an ellipsoid capsule 5–16 cm × 3–6 cm, dark brown to black, 5-valved, loculicidal; valves grooved. Seeds globose to pear-shaped, 4–5 mm in diameter, dark brown to black, embedded in white floss.
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Other botanical information

Bombax is a pantropical genus, comprising 8 species: 2 in Africa, 5 in Asia, and 1 from Asia to the Solomon Islands. Formerly, *Bombax* had a much wider circumscription. *Bombax costatum* is sometimes considered conspecific with *Bombax buonoepense*.

Bombax ceiba L. (synonym: *Bombax malabaricum* DC.; English names: red silk cotton tree, cottonwood, Indian bombax; French names: bombax, fromager; Portuguese name: algodoeiro do mato) is distributed from tropical and subtropical Asia and Australia to the Solomon Islands. It is planted throughout the subtropics and tropics, including tropical Africa, where it has been grown commercially in Tanzania before the Second World War. It is also reported to have been planted in Zimbabwe. *Bombax ceiba* resembles *Bombax costatum*, but is mostly glabrous. In Asia the fruit floss is used for stuffing and insulation, the flowers and leaves as vegetables and fodder; the wood as timber; and all parts as medicine against a wide range of ailments. The seed oil is used in cooking and soap manufacture. The tree is widely planted as ornamental. In India it plays a role in the Holi festival.
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Growth and development

Bombax costatum grows fairly fast. It may grow to a height of 30 m, but in the Sahel it seldom grows taller than 6 m. It flowers after leaf-fall, between October/November and January/February, and new leaves unfold from April onwards. Under favourable conditions, trees start bearing fruit from the 6th year onwards. Fruit ripening begins in August–September. Unfortunately, trees often do not produce fruits due to fire-damage at the critical time of flowering in the dry season. Fruits mostly open while still on the tree and the lightweight seeds are spread by wind. The roots are tuberous and act as water and sugar storage organs for long drought periods.
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Ecology

Bombax costatum is a characteristic tree of the savannas and dry woodlands of the Sudanian zone of West Africa, extending to the north into the Sahelian zone and to the south in the Guinean zone. In Burkina Faso it grows in the 600–900 mm annual rainfall zone. It grows on stony and gravely lateritic soils, and often in cropland and close to settlements. Its thick, corky bark protects it against fire. *Bombax costatum* is usually associated with *Pterocarpus erinaceus* Poir., *Daniellia oliveri* (Rolfé) Hutch. & Dalziel, *Contyia pinnata* (Lepr. ex A.Rich.) Milne-Redh., *Terminalia macroptera* Guill. & Perr. and *Prosopis africana* (Guill. & Perr.) Taub. In the dense forests of the Guinea zone, *Bombax costatum* is replaced by *Bombax buonoepense*.
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Propagation and planting

Bombax costatum is best propagated by direct seeding, but wildlings may also be used. The 1000-seed weight is 35–60 g. Before sowing, the fibrous material covering the seed should be removed. The seed should then be scarified in boiling water and soaked in cold water for 24 hours. Seedlings are difficult to transplant in spite of their vigorous rooting ability. Natural regeneration is easy and abundant when the seedlings are sufficiently protected against fire and livestock. Vegetative propagation is possible.
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Management

Trees coppice well.
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Yield

A tree bears up to 1500 fruits, each with 5–8 g of kapok. Under favourable conditions, 3–5 kg kapok per tree can be obtained from the 10th year onwards.
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| | |
|----------------------------|------|
| General importance | ☆☆☆☆ |
| Geographic coverage Africa | ☆☆☆☆ |
| Geographic coverage World | ☆☆☆☆ |
| Vegetables | ☆☆☆☆ |
| Dye and tannin use | ☆☆☆☆ |
| Forage/feed use | ☆☆☆☆ |
| Fruit use | ☆☆☆☆ |
| Timber use | ☆☆☆☆ |
| Carbohydrate/starch use | ☆☆☆☆ |
| Auxiliary use | ☆☆☆☆ |
| Medicinal use | ☆☆☆☆ |
| Fibre use | ☆☆☆☆ |
| Climate change | ☆☆☆☆ |
| Food security | ☆☆☆☆ |



Bombax costatum
wild



1. part of leafy branch; 2. part of flowering twig; 3. fruit.
Source: Flore analytique du Bénin



Bombax costatum
Bombax costatum



Bombax costatum
Bombax costatum



Bombax costatum
Bombax costatum



Bombax costatum
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Bombax costatum
Bombax costatum



Bombax costatum
Bombax costatum



Bombax costatum
Bombax costatum

Genetic resources and breeding

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In spite of the value attributed to *Bombax costatum* by the local population in the West African parklands, the trees (Males, savannas and parklands) are declining. Several studies have shown that its rejuvenation in the degrading savanna parkland is inadequate to sustain the production of food and fibre. [Fire](#), [insect herbivory](#) and [drought](#) both affect rejuvenation. Although the tree is fire-tolerant, fruits that develop during the dry season are not and several reports indicate that seed supply is inadequate to sustain the proportion of *Bombax costatum* in the parkland vegetation. While the genetic diversity of *Bombax costatum* is not yet in danger, it is under threat as an economic resource.

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Prospects

If *Bombax costatum* is to remain an important and widely available source of food, feed and fibre, more attention to its conservation in the West African parkland vegetation is essential. Remarkably little information is available on the properties of the fibre, on the nutritional value as a vegetable and a fodder, and on its pharmacological composition. Still less is known about its management as an agroforestry species.

[show more data \(0\)](#) [comments \(0\)](#)

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Author(s)

- L.P.A. Oyen
PROTA Network Office Europe, Wageningen University, P.O. Box 341, 6700 AH Wageningen, Netherlands

Editors

- M. Brink
PROTA Network Office Europe, Wageningen University, P.O. Box 341, 6700 AH Wageningen, Netherlands
- E.G. Achigan Dako
PROTA Network Office Africa, World Agroforestry Centre (ICRAF), P.O. Box 30677-00100, Nairobi, Kenya

Photo editor

- G.H. Schmelzer
PROTA Network Office Europe, Wageningen University, P.O. Box 341, 6700 AH Wageningen, Netherlands

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