

Eucalyptus camaldulensis

river red gum

LOCAL NAMES

Amharic (key bahir zaf); Arabic (ban,kafur); Burmese (pylon-chantha); English (long beak eucalyptus,murray red gum,red gum,river gum,river red gum,red river gum); French (eucalyptus rouge,eucalyptus); German (Rotgummibaum,roter eukalyptus); Indonesian (ekaliptus); Italian (eucalipto rostrato); Luganda (kalitunsi); Spanish (eucalipto rojo,eucalipto); Swahili (mkaratusi); Thai (yukhalip); Tigrigna (keih-kelamitos); Trade name (river red gum); Vietnamese (b[aj]ch d[af]n [us]c,pré;ng khchâi slök sâ,bajch dafn usc)

BOTANIC DESCRIPTION

Eucalyptus camaldulensis commonly grows to 20 m tall, occasionally reaching 50 m, with a trunk diameter of 1 (max. 2) m; in open formations has a short, thick bole and a large, spreading crown; in plantations has a clear bole of 20 m with an erect, lightly branched crown; bark smooth, white, grey, yellow-green, grey-green or pinkish grey, shedding in strips or irregular flakes; rough bark occupies the 1st 1-2 m of the trunk.

Leaves grey-blue, alternate, drooping, 8-22 cm long, 1-2 cm wide, often curved or sickle shaped, tapering, short pointed at base.

Inflorescence axillary, solitary, 7-11 flowered; flower buds white, globular-rostrate or ovoid-conical; operculum hemispherical, rostrate or conical, 4-6 x 3-6 mm, obtuse.

Fruit very small capsules at the end of thin stalks, 5-8 mm, valves 4, containing minute seeds.

The genus *Eucalyptus* was described and named in 1788 by the French botanist l'Héritier. The flowers of the various *Eucalyptus* species are protected by an operculum, hence the generic name, which is from the Greek words 'eu' (well) and 'kalyptos' (covered). The specific epithet honours Count Camaldoni in whose garden *E. camaldulensis* was planted in 1803.

BIOLOGY

Time of flowering in natural stands depends on the geography of a given location. Pollination is by insects such as blow flies, ants and bees, and by birds and small mammals. Seeds ripen about 6 months later. *E. camaldulensis* does not develop resting buds and grows whenever conditions are favourable.

Dehnh.

Myrtaceae



flowers (Dennis Haugen, www.forestryimages.org)



fruits (Dennis Haugen, www.forestryimages.org)



tree (Dennis Haugen, www.forestryimages.org)

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ECOLOGY

Its natural distribution covers most of Australia's mainland. Under natural conditions, *E. camaldulensis* occurs typically along watercourses and on floodplains. Very occasionally in southern Australia it extends to hills or ranges, usually in open forest and woodland. It grows under a wide range of climatic conditions, from temperate to hot and from humid to arid zones. The length of the dry season may vary from 0 to 8 months, and the rainfall distribution from a winter maximum in southern regions to a monsoon type with summer rains in northern areas.

BIOPHYSICAL LIMITS

Altitude: 0-1500 m, Mean annual temperature: 3-22 to 21-40 deg. C, Mean annual rainfall: 250-2500 mm

Soil type: Grows best on deep, silty or loamy soils with a clay base and accessible water table. Tolerates waterlogging and periodic flooding. It is one of the species found to be most tolerant to acid soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Australia

Exotic: Albania, Argentina, Bangladesh, Brunei, Cambodia, Eritrea, Ethiopia, Greece, Indonesia, Israel, Italy, Kenya, Laos, Malaysia, Malta, Morocco, Myanmar, Namibia, Nepal, Nigeria, Pakistan, Philippines, Spain, Sudan, Tanzania, Thailand, Uganda, United Kingdom



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

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PRODUCTS

Apiculture: *E. camaldulensis* is a major source of honey, producing heavy yields of nectar in good seasons. The honey is light gold and of reasonable density with a distinctive flavour. It has been marketed as a straight line for several years. It crystallizes readily. The tree is particularly valuable for building up bee populations, especially when pollen from the ground flora is available to provide variety.

Fuel: The firewood is suitable for industrial use in brick kilns but is not preferred for domestic use because it is too smoky and burns too fast. However, it makes good-quality charcoal.

Fibre: *E. camaldulensis* is used for pulp and paper production. It is also planted for hardboard, fibreboard and particleboard.

Timber: Because of its great strength and good durability, the wood is suitable for many structural applications, for example, railway sleepers, poles, posts, floorings, wharves, ship building and heavy construction. The density of the wood is 900-980 kg/cubic m at 12% mc. In Pakistan, it is a raw material for the chipboard industry. Estimates show that in 1993, 800 tonnes of raw material was from this species (Charles and Naughton, 1994).

Tannin or dyestuff: The bole yields a gum that can be used as a dye.

Essential oil: Some tropical provenances of *E. camaldulensis* are rich in 1,8-cineole leaf oil and are potential commercial sources of medicinal-grade eucalyptus oil.

Medicine: The oils are used as an inhalant with steam and other preparations for relief of colds and influenza symptoms. Because of its refreshing odour and its efficiency in killing bacteria, the oil is also used as an antiseptic.

Other products: The bole has some potential for shiitake mushroom (*Lentinus edodes*) cultivation.

SERVICES

Shade or shelter: *E. camaldulensis* is widely planted for shade and shelter. In Sudan it is planted to protect crops from blowing sand.

Ornamental: Its graceful form is attractive for avenues and gardens. It is practicable by judicious trimming to shape it to the requirements.

Intercropping: With its light crown, *E. camaldulensis* is well suited for growing in arable fields. Intercropping maize with trees planted at 5 x 5 m gives satisfactory yields.

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TREE MANAGEMENT

Seedling growth may exceed 3 m per year for well-adapted provenances on favourable sites. Spacing varies with management system, from community planting around homes, villages and roads to closely spaced commercial plantations, and depends on the end products required. Application of 100 g of NP or NPK (3:2:1) fertilizer to each tree at planting to assist establishment and early growth is common. Poor competition ability with weeds and the development of an open crown necessitate frequent weeding, up to 3 times a year, until the canopy closes 3-5 years after planting. A thinning of less than 700 stems/ha at 5 years provides posts, poles, fuelwood and pulpwood, leaving the better trees for the production of other products, such as sawn timber after 10 years. Coppices readily. Crown die-back during the dry season as a result of boron deficiency is prevalent in parts of Africa, Asia and South America.

GERMPLASM MANAGEMENT

Orthodox storage behaviour for 3-10 years; viability maintained for 4 years in hermitic storage at room temperature; viability maintained for several years in hermitic storage at 3 deg. C with 6-10% mc. A fully grown *E. camaldulensis* tree may produce a million or more seeds annually, and may continue so for a century (Lars Schmidt, 2000). There are 700 000-800 000 seeds/kg.

PESTS AND DISEASES

Insects such as termites and aphids and rodents may be troublesome to the tree, and both physical and chemical measures are used to control them. Young trees and those weakened by drought can be badly infected by moth larvae, eucalyptus snout beetle, termites and eucalyptus borer. In the nursery, *E. camaldulensis* is susceptible to various fungi causing damping-off and leaf diseases.

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FURTHER READING

- Albrecht J. ed. 1993. Tree seed hand book of Kenya. GTZ Forestry Seed Center Muguga, Nairobi, Kenya.
- Bein E. 1996. Useful trees and shrubs in Eritrea. Regional Soil Conservation Unit (RSCU), Nairobi, Kenya.
- Bekele-Tesemma A, Birnie A, Tengnas B. 1993. Useful trees and shrubs for Ethiopia. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Boland DJ, Brophy JJ, House APN. 1991. Eucalyptus leaf oils, use, chemistry, distillation and marketing. ACIAR/CSIRO. INKATA Press. Melbourne.
- Boland DJ. et. al. 1985. Forest trees of Australia. CSIRO. Australia
- Charles R H and Naughton GG. 1994. Using industrial wood markets to sustain farm forestry: the Pakistan Experience. In: Raintree JB and Hermina AF (eds.). Marketing multipurpose tree products in Asia. Proceeding of an international workshop. pp 145-151.
- Chingaipie TM. 1985. Early growth of Eucalyptus camaldulensis under agroforestry conditions at Mafiga, Morogoro, Tanzania. Forest Ecology and Management. 11:241-244.
- Clemson A. 1985. Honey and pollen flora. Inkata Press, Melbourne.
- Doran CJ, Turnbull JW (eds.). 1997. Australian trees and shrubs: species for land rehabilitation and farm planting in the tropics. ACIAR monograph No. 24, 384 p.
- Erkkila A, Harri S. 1992. Silva Carelica Forestry in Namibia 1850-1990. University of Joensuu.
- Faridah Hanum I, van der Maesen LJG (eds.). 1997. Plant Resources of South-East Asia No 11. Auxillary Plants. Backhuys Publishers, Leiden, the Netherlands.
- Goldstein M. et. al. 1984. The Macdonald guide to trees. Macdonald & Co. Ltd.
- Hills WE, Brown AG. 1984. Eucalyptus for wood production. CSIRO/Academic Press. Sydney.
- Hocking D. 1993. Trees for Drylands. Oxford & IBH Publishing Co. New Delhi.
- Hong TD, Linington S, Ellis RH. 1996. Seed storage behaviour: a compendium. Handbooks for Genebanks: No. 4. IPGRI.
- ICRAF. 1992. A selection of useful trees and shrubs for Kenya: Notes on their identification, propagation and management for use by farming and pastoral communities. ICRAF.
- Katende AB et al. 1995. Useful trees and shrubs for Uganda. Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Lanzara P. and Pizzetti M. 1978. Simon & Schuster's Guide to Trees. New York: Simon and Schuster
- Luna R K. 1997. Plantation trees. International Book Distributors.
- Mbuya LP et al. 1994. Useful trees and shrubs for Tanzania: Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Noad T, Birnie A. 1989. Trees of Kenya. General Printers, Nairobi.
- Roshetko JM and Evans DO. 1997. Domestication of Agroforestry trees in Southeast Asia. Yogyakarta, Indonesia.
- Soerianegara I, Lemmens RHMJ (eds.). 1993. Plant Resources of South-East Asia. No. 5(1): Timber trees: major commercial timbers. Backhuys Publishers, Leiden.
- Vogt K. 1995. A field guide to the identification, propagation and uses of common trees and shrubs of dryland Sudan. SOS Sahel International (UK).
- Webb DB, Wood PJ, Henman GS. 1984. A guide to species selection for tropical and sub-tropical plantations. Tropical Forestry Papers No. 15, 2nd edition. Commonwealth Forestry Institute, Oxford University Press.

SUGGESTED CITATION

Orwa C, Mutua A, Kindt R, Jamnadass R, Simons A. 2009. Agroforestry Database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/af/treedb/>)