

## Podocarpus falcatus

podo

(Thunb.) R. Br. ex Mirb.

Podocarpaceae

### LOCAL NAMES

Afrikaans (outeniekwageelhout); Amharic (zigba); English (smooth-barked yellow wood, podo, oteninqua yellow wood, East African yellow wood); Trade name (podo); Zulu (umSonti)

### BOTANIC DESCRIPTION

*Podocarpus falcatus* is an evergreen tree up to 46 m in nature but quite smaller if planted, with a long clean and cylindrical trunk. The crown is slender with a light branching system or sub-opposite or verticillate spreading limbs or small, with crowded branches. The bark is thin, rather smooth and greyish-brown to dark brown in colour. It later exfoliates into rectangular to irregular flakes up to 3 cm long. The blaze is pink in colour.

Leaves vary in disposition sometimes being spirally arranged, but at others in two opposite or sub-opposite ranks. They are shortly petiolate and linear to linear-lanceolate, narrowing abruptly to a sharp or blunt apex and basally to a slightly twisted short stalk. The adult leaf is 3-5 x 0.3-0.5 cm, the midrib of the adult leaf is not prominent above but is well marked beneath. The leaf colour is dark green, often with a greyish bloom.

The 1-3 male cones (male strobili) are axillary. Each is slender and catkin-like, 4-26 x 7-15 mm. The colour is yellow to pinkish-purple. The female strobili are solitary, hard, ovoid to 2 cm, very slow to develop, green with dull purple bloom, outer shell thin but inner flesh eaten by monkeys and birds. Usually one seed is produced, at the end of a woody stalk slightly expanded at the apex.

Fruit fleshy and spherical, up to 17 mm in diameter. Mature seeds of *P. falcatus* are large, fleshy, about 1.5-3.5 cm in diameter, almost spherical or subglobose and drupe-like, surmounting a terete pedicel. The testa is very hard, 1-8 mm thick, crustaceous, tubercled and enclosed in a very resinous green to yellowish green somewhat fleshy integument.

The genus name is derived from 'podos', a Greek word for foot and 'karpos' meaning fruit, in reference to the swollen seed stalk. *Falcatus* means sickle-shaped, referring to the shape of the leaves.

### BIOLOGY

The development for both the pollinated and un-pollinated female cones takes place to full size though the latter produce empty seeds. This is due to the fact that the pollination by wind, birds, insects and climbing small mammals is delayed by up to a year by a longer maturing period of the pollen. There is typically heavy seeding at intervals of 2-4 years. In southern Africa flowering occurs from September to May and fruiting mostly throughout the year peaking from December to January.



An avenue of mature East African yellowwood trees in Bukoba, Kagera Province, Tanzania. (Ellis RP)



Fruits (Ellis RP)



The bark is grey to dark brown, flaking in irregular rectangles. (Ellis RP)

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### ECOLOGY

Designations of vegetation within which *P. falcatus* is found include coastal swamp forest, transitional rainforest, dry evergreen forest, undifferentiated forest, and Afromontane rainforest. Occasionally in Afromontane rain forest, but particularly characteristic of undifferentiated Afromontane forest, where it is frequently one of the dominant species ('Podocarpus forest') or one of the co-dominant species (e.g. in 'Juniperus-Podocarpus forest'), often persisting in relic forest patches (gully forests, church forests). Frequent as a single tree left in derived grassland or farmland in areas with sufficient rainfall. It seems sometimes to be cultivated, and it can sometimes be difficult to distinguish between records of cultivation and records of marginal natural distribution.

A humid and warm climate is preferable; in dry and hot areas plantations fail. The East African yellow wood can tolerate moderate frost but not drought.

### BIOPHYSICAL LIMITS

Altitude: 1 550-3 000 m, Mean annual temperature: 13-20 deg. C, Mean annual rainfall: 1 200-1 800 mm

Soil type: Rich, well-drained soils are needed for *P. falcatus*; mainly found on humus-rich sandy soils.

### DOCUMENTED SPECIES DISTRIBUTION

Native: Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Rwanda, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zimbabwe

Exotic: India



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

Food: The ripe fruit is edible but very resinous.

Fuel: *P. falcatus* is a suitable source of firewood.

Timber: It furnishes an excellent timber of an attractive yellow to yellowish brown colour throughout with normally no clear distinction between sapwood and heartwood. The wood is normally straight-grained very fine, featureless and non-resinous. Soft and moderately hard and of medium density, though needs preservatives and careful seasoning to prevent warping. The timber of this species is a standard building timber and is extensively used for floors and roofing though not suitable for external joinery and doorframes. The light wood of high quality is widely used for furniture, panelling, shelving, drawer linings, shop counters and light duty impregnated railway sleepers. Being free of odour and taste, it is the wood most used locally for butter and cheese boxes and other food containers.

Tannin or dyestuff: The bark contains 3-6% tannin and is used for tanning leather.

Poison: Leaves contain podolide, is a main ingredient for insecticide.

Medicine: Oil extracted from the seeds or fruits are used to treat gonorrhoea. The sap is used as a remedy for chest complaints.

### SERVICES

Shade or shelter: The crown makes *P. falcatus* a suitable shade species. In the higher rainfall areas it can be planted as a windbreak around homesteads and crops.

Reclamation: For use in re-forestation it is a species needing special treatment to ensure satisfactory seed germination but maintains good form in a range of planting situations.

Ornamental: The tree is very suitable for planting along roads in cities because of its excellent and attractive form. It makes an pleasant specimen plant on a lawn, standing out in early spring with the new flush of bluish grey leaves contrasting with the dark green mature leaves. Excellent as a pot plant for the patio. These plants can be used as Christmas trees instead of pine or fir trees.

Other services: The large, dense crown is a favourite roosting and nesting site for various bird species.

**TREE MANAGEMENT**

When transplanting the seedling into the open ground, care must be taken not to damage the taproot, as it will result in a long period, sometimes up to a year, during which the tree will show no growth.

A fast growing species with a mean annual increment of up to 1 m/year for 15 years; the growth rate is higher under natural conditions in higher rainfall areas and very fast under garden conditions. Like many other conifer species, it is self-pruning. However branching associated with wide spacing necessitates pruning operations to maintain the quality of the timber. Lack of, or delay in, thinning has a negative effect on growth.

The tree can be successfully planted in a plantation format. East African yellow wood trees 17-18 years old show the wood to be of excellent quality, with an increase in cubic metres when cut 2 years later, at 20 years of age. On good sites trees should be large enough for harvesting 40-50 years after planting. The protection of plantations against fire attack is necessary since the bark does not provide adequate protection for the cambium.

**GERMPLASM MANAGEMENT**

Seed storage is intermediate; viability lost within 3 months in hermetic storage at room temperature with  $13 \pm 2\%$  mc. Viability is reduced after 12 months storage. Seed should be dried to 15% mc before storage, properly dried seeds can be maintained in hermetic storage at 3 deg. C for at least 2.5 years. Seeds can be dried down to at least 6% mc; optimum air-dry storage environments appear to have 6-8% mc and 4-10 deg. C, sub-zero temperatures of -5 deg. C and -20 deg. C. are damaging. Viability can be maintained for 1-2 years in hermetic air-dry storage at cool temperatures. There are about 500-1 100 seeds/kg.

**PESTS AND DISEASES**

Insect larvae attack a considerable proportion of the seed. The fungus *Corynelia urberata* destroys a large number of embryos on scattered individual trees. *P. falcatus* is known to have natural chemical defences making it resistant to insect attack, however, the fresh sawn timber is attacked pin-hole borers and blue-stain fungi.

In North America, the only diseases recorded on *Podocarpus* are a root rot caused by the fungus *Clitocybe tabescens* and the burrowing nema *Rodopholus similis* in Florida. Nine species of scale insects have been recorded on *Podocarpus*.

**FURTHER READING**

- Albrecht J. ed. 1993. Tree seed hand book of Kenya. GTZ Forestry Seed Center Muguga, Nairobi, Kenya.
- Anon. 1986. The useful plants of India. Publications & Information Directorate, CSIR, New Delhi, India.
- Beentje HJ. 1994. Kenya trees, shrubs and lianas. National Museums of 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).
- Birnie A. 1997. What tree is that? A beginner's guide to 40 trees in Kenya. Jacaranda designs Ltd.
- Coates-Palgrave K. 1988. Trees of southern Africa. C.S. Struik Publishers Cape Town.
- Friis I. 1992. Forests and forest trees of northeast tropical Africa. Her Majesty's Stationery Office, London.
- 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.
- Kabera I. 1990. Podocarpus falcatus: A monograph and appraisal with special reference to Rwanda. A thesis submitted in the University of Wales for the degree of Magister in Philosophiae. Bangor, UK.
- Leeuwenberg AJM. 1987. Medicinal and poisonous plants of the tropics. Pudoc Wageningen.
- 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.
- Pirone PP. 1978. Diseases and pests of ornamental plants. A Wiley-Interscience Publication.
- Venter F, Venter J-A. 1996. Making the most of Indigenous trees. Briza Publications.
- Watt JM, Breyer-Brandwijk. 1962. Medicinal and poisonous plants of southern and eastern Africa. E & S Livingstone Ltd.

**SUGGESTED CITATION**

Orwa C, A Mutua, Kindt R, Jamnadass R, S Anthony. 2009 Agroforestry Database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp>)