

Juniperus procera

cedar, African pencil cedar

Hochst. ex Endl.

Cupressaceae

LOCAL NAMES

Amharic (tid,tedh); Arabic (arar); English (pencil cedar,East African pencil cedar,East African cedar,cedar,African pencil cedar); Swahili (mwangati); Tigrigna (tsihdi); Trade name (cedar,African pencil cedar)

BOTANIC DESCRIPTION

Juniperus procera is an afro-montane tree often reaching 30-35 m high; can reach 50 m, actually the largest tree of its genus. Bole straight but sharply tapered, often with a pronounced twist, commonly heavily fluted, reaches 2-3 m dbh. Bark pale brown to reddish-brown, thin, fibrous, with thin shallow longitudinal fissures, exfoliating in thin papery strips.

Leaves grey or glaucous when mature, about 1 mm long, acute, hooded and keeled at the apex, and with a narrow translucent margin and an elliptic oil gland on the back near the base. Juvenile leaves deciduous, in whorls of 3 on shoots, 1-2 cm long, linear and spine tipped, lower part decurrent on the branch, oil gland on abaxial surface, linear, extending 75% of the leaf length. As plant ages, the leaves gradually change until foliage characteristic of mature tree is produced.

Inflorescence a dioecious cone. Male cones solitary, terminal on short branchlets, small (about 3 mm long), ellipsoid to subglobose, yellowish, consisting of 5-6 pairs of decussate, subpeltate, obtuse or blunt apiculate scales, each with 2-3 pollen sacs. Female cones solitary, terminal, on short lateral shoots, consisting of 3-4 pairs decussate fleshy scales and bearing a solitary erect ovule.

Fruit berrylike, globose or subglobose, reddish-brown to blue-black, waxy, composed of confluent, swollen, fleshy scales with distinguishable tips on female cone, 4-8 mm diameter when ripe, containing up to 4 brown seeds about 5 mm long, with a woody testa, each flattened or triangular. Additional 1-3 smaller aborted seeds are common.

Juniperus is the classical Latin name of the junipers, from the Celtic word for rough, referring to the texture of the bark. The specific name, 'procera', is Latin for tall or high.

BIOLOGY

The species flowers and seeds only periodically every several years. The flowers are inconspicuous. The tree is dioecious and wind pollinated.



The entire tree at the Nairobi Arboretum. (Ellis RP)



The bark is finely and deeply longitudinally grooved. Peels with age. (Ellis RP)



Juniperus procera trunk (Patrick Maundu)

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ECOLOGY

J. procera and *J. excelsa* make up a closely related species pair, which together cover a distribution area largely coinciding with that of *Olea europaea* ssp *cuspidata*; it is also associated with *Podocarpus falcatus*. It is an important component of forest that is transitional between dry, single-dominant afro-montane forest and semi-evergreen bushland and thicket. *J. procera* will not regenerate in mature forest but is replaced by *Podocarpus* forest and similar forest types. The species is susceptible to fire.

BIOPHYSICAL LIMITS

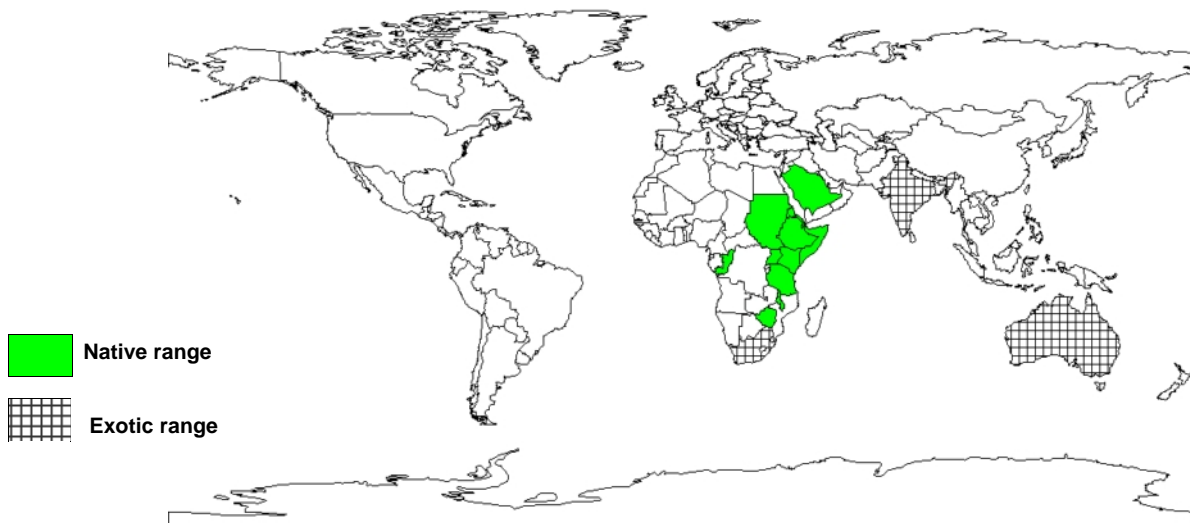
Altitude: 1100-3500 m, Mean annual rainfall: 400-1200 mm

Soil type: Prefers well-drained soils no heavier than sandy clay. Can be found scattered on rocky sites; limestone, gneiss and granite of the Basement complex and basalt.

DOCUMENTED SPECIES DISTRIBUTION

Native: Congo, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Kenya, Malawi, Saudi Arabia, Somalia, Sudan, Tanzania, Uganda, Yemen, Republic of, Zimbabwe

Exotic: Australia, India, South Africa



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: Older trees are usually hollow and can be used in making beehives.

Fuel: Wood burns quite well hence a useful species for firewood.

Fibre: The wood is suitable for making hardboard and particleboard.

Timber: The wood is fine textured, straight-grained and of medium hardness, difficult to season, rather brittle at the edges; it splits on nailing, is durable, easy to work and polish, and whittles and glues well. Mainly used for construction, power transmission posts, fencing and telegraphic poles, manufacturing pencils, furniture. Cedar wood has a distinctive smell. Heartwood resistant to termite attack.

Medicine: The bark and leaves are used for medicinal purposes.

Lipids: Cedar wood oil distilled from sawdust is used in the cosmetic industry to manufacture perfumes.

SERVICES

Shade or shelter: The spreading crown of the tree forms a suitable shade.

Ornamental: The species is a frequently planted as an ornamental tree.

Boundary or barrier or support: *J. procera* can be planted on boundaries and as a windbreak.

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TREE MANAGEMENT

J. procera can be grown in plantations, in homesteads or on boundaries. Weeding has to be carried out at least once in a year during the early stages of growth. Early pruning should take place following 3-6 years of establishment. First thinning is done in the 5th year, when about 50% of the stems should be removed. Due to the acidic substances released from the decomposing leaves, which are harmful to crops, intercropping is not recommended.

GERMPLASM MANAGEMENT

Seed storage behaviour is orthodox; viability can be maintained for several years in hermetic storage at 3 deg. C with 7-8% mc. There are about 40 000-50 000 seeds/kg. Due to the hard seed coat, hot water or acid pretreatment is recommended; immersing the seed in hot water at 100 deg. C, for 1 minute or soaking in sulphuric acid for 10 minutes increases germination rate. Stratification in damp sand at 3 deg. C for 60 days is another alternative. On average, mature and pretreated seeds have a germination rate of 60-70% within 25-80 days.

PESTS AND DISEASES

The tree is attacked by borers and the cypress aphid (*Cinara cupressii*). Older trees are susceptible to heart rot fungus (*Fomes juniperinus*).

FURTHER READING

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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>)