Dichrostachys cinerea

Wight et Arn.

Fabaceae - Mimosoideae

LOCAL NAMES
Afrikaans (sekelbos); Amharic (ader,ergett-dimmo); Arabic (hurgam,kaddad,kadada,hurgan,heghem,hegam,um Kedad,kadad); Bemba (kansalonsalo,katenge); English (sickle bush,marabou thorn,Chinese lantern tree,kalahari Christmas tree,bell mimosa); French (mimosa clochette); Hindi (khairi,kunlai,nutan); Indonesian (epung,pung,pereng); Lozi (muselesele); Luganda (muwanika); Lunda (mubanga); Ndebele (ugagu); Nyanja (katenge); Shona (mupangara); Somali (ditar); Spanish (mazabu); Swahili (mvunja shoka,mkingiri,msigino,mkulajembe,mkulagembe); Tamil (vadataram); Thai (hangsuea,krathin wiman,nom suea); Tigrigna (gonnok,ghonok); Tongan (katenge); Tswana (mosêlêsêlê); Zulu (uGagane,umThezane,umZilazembe,uSegwane)

BOTANIC DESCRIPTION
Dichrostachys cinerea is a semi-deciduous to deciduous tree up to 7 m tall with an open crown. Bark on young branches green and hairy but dark grey-brown and longitudinally fissured on older branches and stems; smooth on spines formed from modified side shoots. Slash cream coloured to light yellow. Strong alternate thorns, up to 8 cm long, almost at right angles, slightly recurved, grow out of the branches and may bear leaves at the base. Twigs grey brown violet, with prominent light lenticels.

Leaves bipinnate; rachis 4-8 cm, with 5-15 (max. 19) pairs of pinnae, which each bear (min. 9) 12-22 (max. 41) pairs of leaflets; terminal pair of pinnae shorter, dark green, underside pale. Leaflets about 8 x 2.5 mm wide; leaflets and petioles very tomentose and ciliate.

Flowers very characteristic in bicoloured cylindrical, dense, petioled, pendulous spikes (bottlebrush), 6-8 cm long and fragrant. Terminal lower flowers hermaphroditic, with 1 pistil and 10 yellow stamens each. Upper flowers of a hanging spike are sterile, reddish or pale purple, with protruding staminodes.

Pods narrow, yellow or brown; generally twisted or spiralled, up to 100 x 15 mm, in dense, stalked, intertwined clusters; indehiscent. About 4 black seeds with a spot at one end per pod.

It seems possible that 2 subspecies can be recognized: D. cinerea. ssp. africana and D. cinerea ssp. nyassana . The latter tends to grow larger and has larger and less hairy leaves and leaflets.

The generic name ‘Dichrostachys’ means ‘2-coloured spike’, and ‘cinerea’ refers to the greyish hairs of the typical subspecies, which is confined to India; from the Greek ‘konis’ and the Latin ‘cineres’. In South Africa it is called the ‘Kalahari Christmas tree’, and because of the attractive 2-coloured hanging flowers some people call it ‘tassels for the chief’s hat’. But most commonly it is known as the ‘sickle bush’, because the young pods are curved like sickles.

BIOLOGY
In Indonesia, D. cinerea has been found flowering from September to June and fruiting from March to May, sporadically in other months; in southern Africa flowering is from October to February and fruiting from May to September. The structure of the inflorescence suggests pollination by bats. The infructescence has a strong aroma, which probably attracts animals to feed on the pods. A fraction of seeds exhibit polyembryony with usually 2, sometimes 3, or rarely more embryos; the extent of polyembryony seems to be positively correlated with the number of seed produced.

Dichrostachys cinerea flowering branch. (Joris de Wolf, Patrick Van Damme, Diego Van Meersschaut)

Dichrostachys cinerea bark. (Joris de Wolf, Patrick Van Damme, Diego Van Meersschaut)

Immature pods of Dichrostachys cinerea. (Joris de Wolf, Patrick Van Damme, Diego Van Meersschaut)

ECOLOGY
D. cinerea penetrates clear-cut areas far into the rainforest zone. In Malaysia, it occurs in areas with strong seasonal climate, usually on poor, occasionally clayey soils, in brushwood, thickets, hedges, teak forest and grassland. Forms dense hammocks on lateritic soils in Senegal and Sudan, while in India it occurs in dry deciduous forest. It can be an indicator of overgrazing in low rainfall areas. Usually not frost resistant and tolerance is less on poor soils, but definitely drought resistant. It is fire resistant and does not tolerate waterlogging. It is a weedy species. For instance in Cuba, the tree is unchecked and forms veritable forests on hill land or in areas on which cane growing has been discontinued. In some parts of central Cuba, there are reports that whole farms have been rendered useless by this foreign weed.

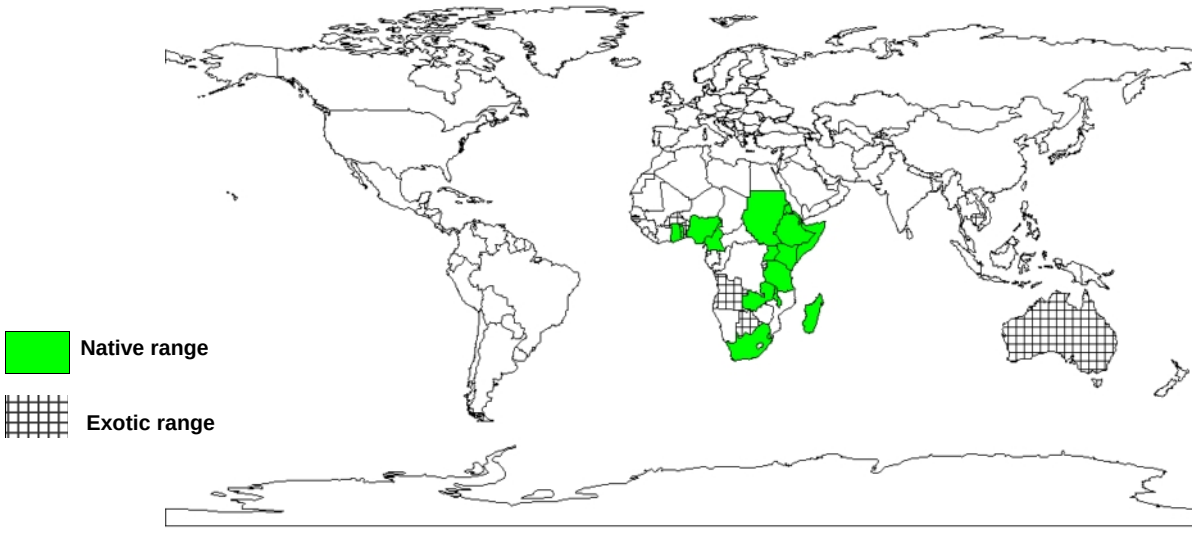
BIOPHYSICAL LIMITS
Altitude: Up to 2 000 m, Mean annual temperature: -2 to 50 deg. C, Mean annual rainfall: 200-900 mm

Soil type: Best growth occurs on deep, sandy loamy soils; it can tolerate a wide pH range.

DOCUMENTED SPECIES DISTRIBUTION

Native: Cameroon, Djibouti, Eritrea, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Nigeria, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia

Exotic: Angola, Australia, Benin, Botswana, Brunei, Burkina Faso, Burundi, Cambodia, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Cuba, Democratic Republic of Congo, Egypt, Gabon, Gambia, Guinea, Guinea-Bissau, India, Indonesia, Iran, Laos, Lesotho, Liberia, Malaysia, Mali, Mauritania, Mozambique, Myanmar, Namibia, Niger, Philippines, Rwanda, Sao Tome et Principe, Senegal, Seychelles, Sierra Leone, Thailand, Vietnam, Yemen, Republic of, Zimbabwe



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.

PRODUCTS
Food: Fruit and seeds from D. cinerea are edible.

Fodder: Cattle, camels and game (giraffe, buffalo, kudu, Lichtenstein's hartebeest, nyala, impala, klipspringer, red duiker and Damara dik-dik) relish the juicy pods that drop to the ground and even eat the young twigs and leaves. Leaves are highly palatable, rich in protein (11-15% crude protein) and mineral content. Young shoots and pods are also browsed by smaller domestic animals. Pods and seeds do not contain hydrocyanic acid, minimizing the chance of poisoning animals.

Apiculture: The flowers are a valuable honey source.

Fuel: The wood is dense, burns slowly with few sparks and emits a non-toxic smoke, making it excellent firewood. It often grows many small trunks, ideal in size for carrying in a headload.

Fibre: The bark yields a strong fibre used for various applications such as twine. The debarked roots are used for strong plaiting work such as for racks and baskets.

Timber: D. cinerea yields a medium to heavy, durable hardwood with a density of 600-1190 kg/cubic m at 15% mc. Heartwood red or dark purple with darker streaks, sharply differentiated from the yellowish-brown sapwood; grain straight or slightly interlocked; texture rather fine and even. Due to its generally small dimensions, its utilization is limited making such items as walking sticks, handles, spears and tool handles. Fencing posts are durable and termite resistant, easily lasting up to 50 years.

Medicine: The bark is used to treat dysentery, headaches, toothaches, elephantiasis and acts as a vermifuge. Root infusions are taken for leprosy, syphilis coughs, as an anthelmintic, purgative and strong diuretic. Pounded roots and leaves are used to treat epilepsy. The roots are chewed and placed on the sites of snakebites and scorpion stings, and the leaves, which are believed to produce a local anaesthesia, are used for the same purpose and also as a remedy for sore eyes and toothache. Leaves are taken as a diuretic and laxative, and used for gonorrhoea and boils; powder from leaves is used in the massage of fractures. The plant is used as a veterinary medicine in India.

SERVICES
Erosion control: The plant is widely used for sand dune stabilization and soil conservation; in India, it is recommended for shallow soils, arid western and subhumid alluvial plains and highly degraded calcareous wastelands.

Reclamation: Owing to its strong capacity for natural regeneration, it has high potential for ravine afforestation and other soil conservation purposes on difficult sites.

Nitrogen fixing: D. cinerea fixes atmospheric nitrogen.

Soil improver: The leaves, rich in nutrients, are frequently used as a green manure. In the Sahel, particularly along riverbanks, it is said to improve soils.

Ornamental: The sickle bush can be planted in the garden to show off the beautiful pink and yellow lantern flowers during early summer and the interesting branching pattern during winter. A favourite plant to train as a bonsai.

Boundary or barrier or support: Thorn branch enclosures prevent livestock from straying at night and protect vegetable gardens, cash crops and fodder- or thatch-grass reserves from livestock. Since it is difficult to control, having an aggressive weedy character, the use of D. cinerea as a live fence is limited.

Intercropping: Highly compatible with certain improved arid-zone grass and forage species such as Cenchrus ciliaris, Lasiurus sindicus and Stylosanthes hamata, making it well suited to silvoipastoral systems.

TREE MANAGEMENT
It grows at a medium to slow rate, 6-8 cm/year. For fuelwood plantations, dune stabilization, ravine afforestation, or erosion control, the spacing should be 3 x 5 m; for silvopasture, 8 x 8 m. Dense plantings help stabilize gully plugs and check-dams. To get maximum fuel biomass, the plants should be harvested at 10 years. However, if the production objective is only fodder, trees should be coppiced every other year after reaching about 5-6 m in height. The plant has moderately vigorous coppicing ability and can also be pollarded and lopped. A plant in the range of 7-8.5 cm collar diameter is suitable for coppicing, and the whole plant can be harvested 15 cm above ground level. The number of regenerated shoots varies between 5 and 9, of which 2-3 branches attain better growth in height, diameter and biomass.

For soil conservation, the species should not be disturbed in any way. Its prolific root suckers will then provide natural spread for complete ground cover within a few years. Later a fodder harvest can be taken by lopping leaves and pods. In the 6th year, the total aboveground biomass is about 31 kg (dry). Thus an average yield of 3.4 t (1.2 t dry) fodder and 22.8 t (11.1 t dry) firewood may be expected on the 6th year from 1 ha of wasteland. It yields about 1 kg of seed pods/tree.

D. cinerea enroaches rapidly on overgrazed, trampled ground and on old lands where the grass cover has been removed. It is difficult to eradicate as it shoots again from portions of root. In certain situations, mechanical or chemical control measures are the only ways to control the potentially serious weed.

GERMPLASM MANAGEMENT
Orthodox seed storage behaviour; little loss in viability during 26 years of hermetic storage at room temperature. Add ash to stored seed to reduce insect damage. Can be stored for up to 10 years at room temperature if kept dry and free from insects. There are 50 500-66 500 seeds/kg.

PESTS AND DISEASES
Larvae of the satyr charaxex (Charaxes ethalion ethalion) feed on the sickle bush.

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