

# *Cultivation and Management of Diospyros ebenum (Ceylon Ebony)*

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## **Keywords**

*Diospyros ebenum*, Ceylon Ebony, evergreen tree, black heartwood and high-value applications

*How to cite this article:*

Kumar, P., Rani, A. M. S., Venkatesan, M., Mangammal, P., Angelin, J. A. and Subbulakshmi, V. 2025. Cultivation and Management of *Diospyros ebenum* (Ceylon Ebony). *Vigyan Varta* 6 (10): 10-14.

## **ABSTRACT**

*Diospyros ebenum* Koenig, commonly known as Ceylon Ebony, is a slow-growing, medium to large evergreen tree belonging to the family Ebenaceae, native to Peninsular India and Sri Lanka. Valued for its exceptionally dense and black heartwood, it is one of the most sought-after sources of commercial ebony globally. This species is primarily found in dry deciduous and mixed evergreen forests, usually as an understorey tree. Due to overexploitation for high-quality timber, *D. ebenum* is currently classified as 'Data Deficient' on the IUCN Red List, highlighting the need for focused conservation and management strategies. Propagation is typically through seeds, which exhibit high viability when sown fresh under shaded nursery conditions. The tree prefers tropical to sub-tropical climates, well-drained soils and full sun to moderate shade. Management practices include proper irrigation, thinning, minimal pruning, mulching and protection against pests like termites and diseases. The application of organic fertilization significantly enhances growth and timber quality. The heartwood is extremely dense, black, fine-grained and highly durable, making it ideal for high-value applications including furniture, musical instruments, ornamental carvings and precision tools. Its slow growth rate and high commercial value necessitate sustainable cultivation practices, controlled harvesting and reforestation efforts to ensure long-term availability and ecological stability.

## INTRODUCTION

**Local Names:** English (Mauritius ebony, ebony persimmon, Ceylon ebony)

**Regional:** *Kari Mara* (India, Sri Lanka)

**D**iospyros is a large genus belongs to family Ebenaceae native to India and Srilanka. It is slow growing medium sized tree up to 30m tall and up to 90cm in diameter, bole straight, with buttresses up to 2m high. Crown dense, bark surface scaly, fissured, black to greyblack (Finkel et al., 2002). Many tree of widely different affinities produce the heavy black hard wood is called ebony. The most important source of ebony was *Diospyros ebenum*, the first species of the genus to be recognized botanically in Ceylon and was described by Koenig in 1776. *Diospyros ebenum* Koenig belongs to family ebenaceae commonly called as “Kari Mara” or ebony. It is the large evergreen tree with a dense crown of dark green leaves and attains a height of about 25m, with a clear bole of about 8m and girth 2.50m. The species is under threat due to large scale illicit felling for its timber quality. This species is said to produce the best commercial black ebony. It is mainly exported to China for furniture and to Europe as fancy wood. The tree is cultivated in plantations as a timber crop and is also grown as a shade tree. The tree is heavily exploited in the wild. It has been renowned since ancient times for its black wood and it is still regarded as the best commercial black ebony. The plant is classified as 'Data Deficient' in the IUCN Red List of Threatened Species

### Distribution

The natural and present day distribution of the species is in South India and Sri Lanka (Matthew, 1983). *D. ebenum* is part of the Tropica dry evergreen forest of South India and Sri Lanka (Broun 1899 and Champion and Seth 1968) It occurs naturally in Dry

deciduous forests and comparatively dry mixed evergreen forests usually as an understorey tree with other *Diospyros* species, *Vitex altissima* and *Albizia odoratissima*.

### Botanic description

*D. ebenum* is a slow-growing medium-sized tree up to 30 m tall and up to 90 cm in diameter. Bole straight, with buttresses up to 2 m high; crown dense. Bark surface scaly, fissured, and black to grey-black. Leaves ovate-oblong to oblong-lanceolate, 5-13 cm x 2-6 cm, base cuneate to rounded, apex slightly acuminate to rounded, glabrous, tertiary venation reticulate, inconspicuous above, prominent below. Flowers mostly male and bisexual; male flowers in 3-16-flowered cymes, 4- merous, stamens 16; female and bisexual flowers solitary, 3-4 merous, calyx lobes valvate, glabrous, corolla divided to about halfway, staminodes 8, ovary with a single 4-5-lobed style and 8 uni-ovulate locules. Fruit depressed globose to subglobose, up to 1.5 cm across, glabrous. *D. ebenum* has been known for its black wood since ancient times. In Sri Lanka, ebony occasionally seeds twice per year.

### Propagation

Seed - it has a very short viability and so should be sown as soon as possible. The flesh should be removed since this contains germination inhibitors. Sow the seed in a shady position in a nursery seedbed. The sowing media for ebony uses soil and fine sand at the ratio 3:1. The seed is planted horizontally or vertically with the radicle end down, with a sowing depth of 1 - 1½ times the thickness of seed. Distance between the seeds is 3 - 5cm. Seeds are very sensitive to desiccation during germination and early growth, so must be regularly watered at this time normally the seed will germinate after

one week. In one trial, fresh seed, sown one day after collection, showed 85% germination rate within 17 - 65 days. As a rule fresh seeds have a high percentage of fertility. The seedlings develop long taproots at an early stage, often before any appreciable elongation of the shoot takes place. The growth of the seedling is decidedly slow.

### Cultivation and Care.

*Diospyros ebenum* cannot tolerate freezing and must *Diospyros ebenum* be planted in a tropical area. Usually, seeds are used to proliferate it. (Ceylon ebony) thrives in tropical to sub-tropical climates. The temperature can tolerate upto 20–35°C and require annual rainfall ranges from 1000–2000 mm annually. It prefers well drained soils with clay Inclination for soil although it can tolerate a variety of soil types; *Diospyros ebenum* likes rich, well-drained soils. For field planting, a spacing of 3 meters x 3 meters is recommended to ensure proper growth and canopy development and for agroforestry systems, a spacing of 4 meters x 4 meters is advised to allow for mechanized ploughing and intercrop cultivation. Intercropping a wide range of intercrops can be cultivated alongside **D. ebenum**, except for paddy, which requires flooded conditions incompatible with this species. Watering: The tree has to be watered often, especially in dry spells. Waterlogging is not tolerated, though. Sun light is essentials for *Diospyros ebenum* to flourish; full sun to moderate shade is excellent.

### Irrigation

- **Young Plants:** Require **frequent watering**, especially during dry periods
- **Mature Trees:** More drought-tolerant, but still benefit from occasional watering in prolonged dry spells
- **Warning:** Avoid overwatering and **never allow water to stagnate** around the roots

### Thinning

**Thinning** is a critical silvicultural practice for managing slow-growing, high-value hardwoods like *Diospyros ebenum*. While this species is typically slow-growing and grown either in **natural forests, plantations** or **agroforestry systems**, thinning helps improve overall **growth, timber quality** and **stand health**.

### Timing of Thinning

Stage	Timing	Notes
<b>First thinning</b>	6–8 years after planting	Remove dead, diseased, and suppressed trees
<b>Second thinning</b>	Around 12–15 years	Selectively remove trees with poor form or slow growth
<b>Subsequent thinning</b>	Every 5–7 years as needed	Based on stand density and growth rates

### Pruning

*Diospyros ebenum* often doesn't require pruning, but if it is, it should be done to get rid of any damaged or dead branches. To make precise cuts without endangering the tree, use sharp, clean pruning tools.

### General Maintenance

- **Mulching:** Helps retain moisture and suppress weeds
- **Weeding:** Regularly during the first 2–3 years
- **Fertilization:** Use organic compost or farmyard manure annually
- **Pruning:** Minimal; only to remove dead or diseased wood

### Pest & Disease Resistance

- Generally **resistant**, but:

- Young trees may be vulnerable to **termites**
- Poor drainage can lead to **root rot** or fungal infections
- **Preventive Care:** Use neem-based organic sprays and maintain healthy soil conditions

#### Utilization :

The *Diospyros ebenum* is said to produce the best commercial black ebony. The sapwood is light yellowish grey, often streaked with black; heartwood very black, heavy with a specific gravity of 1.12. The wood is straight grained, fine and even-textured with a high glossy finish. The wood is difficult to season and work by hand. It is resistant to insect attack and fungi and very durable. It is mainly exported to China for furniture and to Europe as fancy wood. It finds use in sports goods, musical and mathematical instruments, ornamental carvings and turnery. Poison: Fruits are used as fish poison. Medicine: The gummy astringent fruits are used as a medicine and eaten in times of famine. Service shade or shelter: The tree has been planted in India as a shade tree for cardamom.

#### Other Uses

The heartwood is very black; it is clearly demarcated from the light yellowish grey sapwood that is often streaked with black. The texture is very fine, close and even; the grain straight. The wood is very hard, heavy, very durable, being resistant to insect attack and fungi. The wood is difficult to season and work by hand, it takes a high glossy finish. It is mainly exported to China for furniture and to Europe as fancy wood. It finds use in sports goods, musical and mathematical instruments, ornamental carvings, piano keys, chess pieces, rulers, the backs of brushes, stands for ornaments and turnery. We do not have any more specific information for this species.

However, though varying widely in the relative proportion and the colouring of sapwood and heartwood, all the woods of the genus *Diospyros* are practically indistinguishable as regards their structure, as described below: Whether or not a given species produces heartwood depends largely on the size the tree has attained, but evidently also on other conditions, as there is a wide variation in the relative amounts of sapwood and heartwood even in individuals of the same species. When produced, the heartwood can be black with rosy, yellowish, brownish, or ashy streaks, sometimes it is nearly or totally black; it is generally sharply demarcated from the thin to very wide band of whitish, yellowish, or red sapwood. The texture is fine, smooth and (especially in the heartwood) very dense; the grain is generally very straight. The wood is hard to very hard; heavy to very heavy; the sapwood is tough and flexible whilst the heartwood is brittle; the heartwood is very durable, the sapwood moderately so. It is difficult to season well, logs almost invariably checking in several directions from the heart outward, while sawn lumber must be stacked carefully and weighted to prevent warping; once thoroughly dried, however, it becomes very stable. Its density makes it difficult to work, but it takes a beautiful surface under sharp tools. Small trees containing little or no heartwood are used locally for posts, beams, joists, rafters, window sills, parts of agricultural implements, etc.; also, in lumbering, small poles are used for skids on account of their hardness, toughness and smooth wearing qualities. The heartwood (or sometimes sap and heart together) is used for scabbards, canes, hilts, tool handles, gunstocks, saw frames, etc.; it is a favorite for musical instruments, especially finger boards

and keys of guitars; furniture, cabinetwork, inlaying; paper weights, inkstands and similar desk supplies; the sapwood, which is almost as hard as the heartwood and very much tougher, is an excellent material for T-squares and other drawing instruments, for shuttles, bobbins, spindles, golf-club heads and shafts, axe, pick, and hammer handles, etc

## CONCLUSION

*Diospyros ebenum* is one of the most valuable hardwood species globally, both culturally and economically. Due to its **slow growth, limited distribution** and **high demand**, it requires **careful cultivation, protection** and

**sustainable harvesting practices** to ensure its long-term survival and continued availability.

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