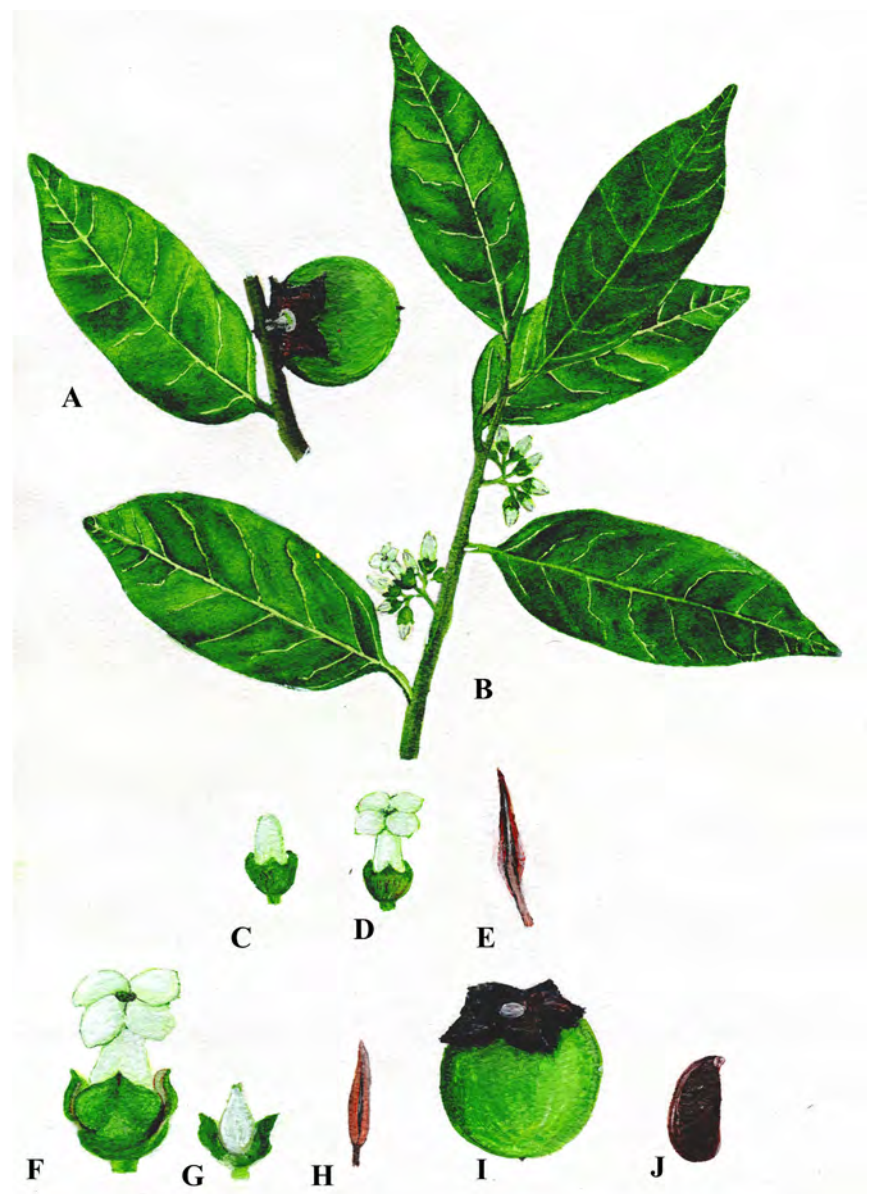


## Taxonomic notes and illustration of *Diospyros crumenata*, a Critically Endangered and endemic tree species of the Western Ghats

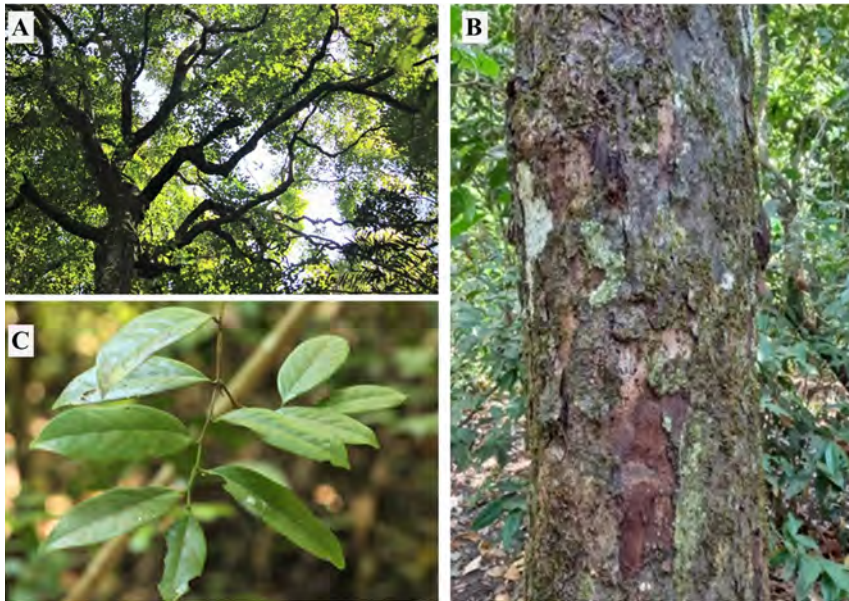
*Diospyros* L. is the largest genus of the Ebenaceae family, comprising over 500 species, thus ranking as one of the largest genera of angiosperms (Turner et al. 2013). The primary centre of species diversity is located in Asia and the Pacific region, with approximately 300 species. Certain species within this genus, such as persimmons (e.g., *D. kaki*, *D. lotus*, and *D. virginiana*), bear edible fruits, while the wood of ebony (e.g., *D. ebenum*) is considered one of the most valuable timbers. The habit of the *Diospyros* L. species are typically found as shrubs or trees in various tropical and subtropical environments, where they often play significant and distinctive roles (Turner et al. 2013). India, for instance, hosts 66 species of *Diospyros* (Singh 2005), with 17 species displaying endemism. The Western Ghats region is acknowledged as a biodiversity hotspot, supporting a rich diversity of angiosperms,



Hand painted illustration of *Diospyros crumenata* Thwaites. A—Female branch | B—Male branch with flowers | C—Male flower bud | D—Male flower | E—Stamen | F—Female flower | G—Gynoecium | H—Staminode | I—Fruit | J—Seed. © Shashwathi H.S.

including 24 species of *Diospyros* (Gamble 1915–1936).

According to global distribution record *Diospyros crumenata* is one of the Critically



A—Branching pattern of the tree | B—Bark structure | C—*Diospyros crumenata* habit. © Shashwathi H.S.

Endangered tree species which are endemic to southern Western Ghats and Sri Lanka. (Bachan & Devika 2023). They are commonly known as Kanthumari or Karithumari in Kannada. These trees are well known for their edible fruits. Wood is used for agricultural implements.

Prior to implementing conservation measures, acquiring comprehensive knowledge about each species is imperative. Therefore, the present research offers insights into the taxonomic characteristics and geographical distribution of these trees within specific regions of Karnataka, which forms part of the Western

Ghats. This paper clearly gives the description, along with photographs and illustrations of the plant, serving as a valuable field guide for ease of identification to aid in conservation efforts.

### Plant description

*Diospyros crumenata*

Thwaites.

### Taxonomic Classification (APG IV)

**Kingdom:** Plantae

**Sub kingdom:** Pteridobiotina

**Phylum:** Angiosperms

**Order:** Ericales

**Family:** Ebenaceae

**Genus:** *Diospyros* L.

**Species:** *Diospyros crumenata* Thwaites

**Habit:** Evergreen trees which may grow up to 50–60 feet height and 70–90 cm girth. Dioecious in nature, Dark greyish coloured scaly bark where branches are not armed.

### Habitat and Distribution:

The trees were seen to be distributed in evergreen and semievergreen forests. Central parts of Western Ghats especially in Karnataka was taken for consideration of the study during 2022–2024.

The trees were observed in several forests of Shivamogga District. Random sampling with three belt transects of 250 × 4 m was studied in study sites. Joga, Hosagunda (Sagra Taluk), Kalikapura, Malur (Hosanagara Taluk) showed their presence. Location map

**Table 1. Number of regenerating individuals and adult trees of *D. crumenata* in four different areas studied.**

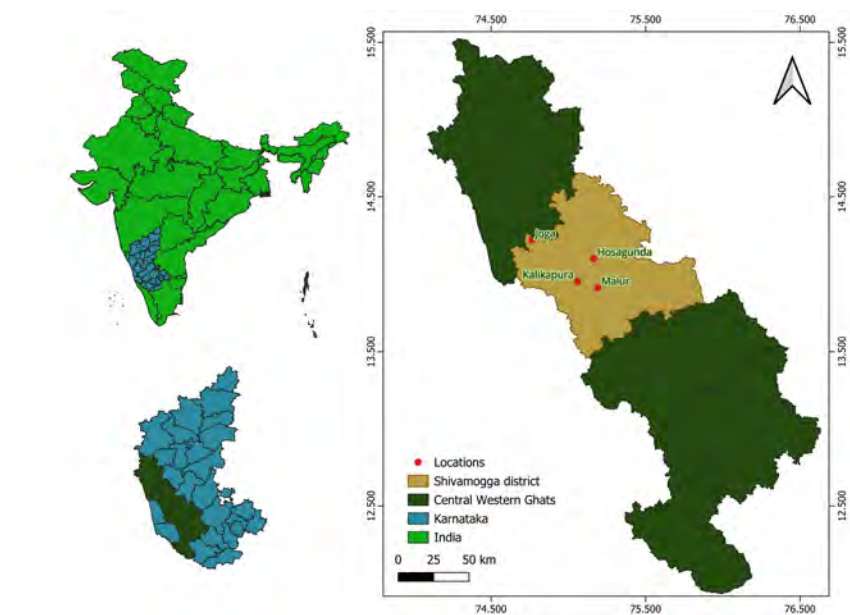
Study sites	Seedlings	Saplings	Poles	Adult trees
Hosagunda	9	16	18	13
Joga	6	5	4	4
Malur	8	13	9	5
Kalikapura	6	2	6	10

of these areas is depicted. Limited samples were collected and deposited as herbarium in Department of Botany, Kuvempu University with specimen voucher number KUAB807- ABDIO3 collected at Malur region (13.9106 N, 75.1911 E) Hosanagara Taluk, Shivamogga District, Karnataka. The number of individuals of *Diospyros crumenata* found in these four sites and number of regenerating individuals in seedling, sapling and pole stages are mentioned in Table 1.

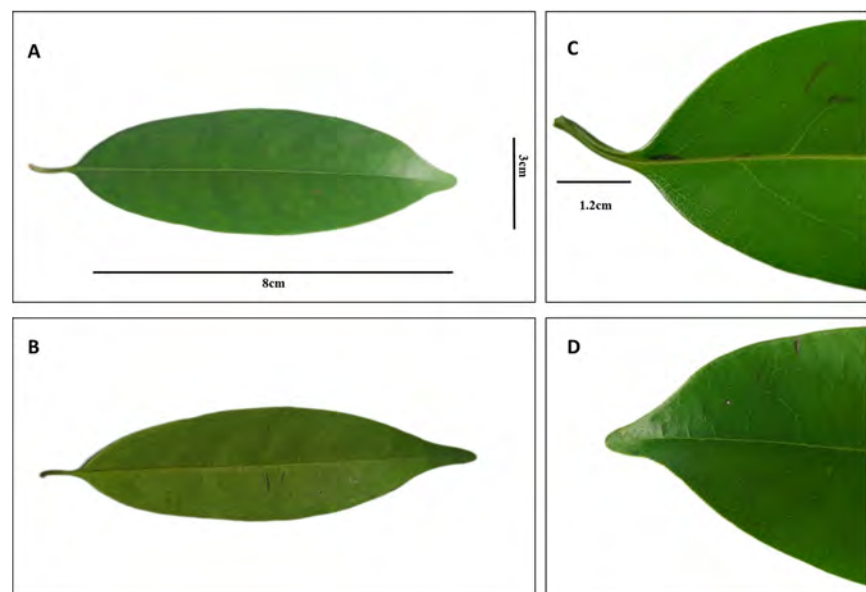
**Leaves:** Alternate, leaf blade – 7–12 × 3–5 cm, leaf shape elliptic or elliptically oblong, leaf apex – obtusely sub-acuminate, leaf base – obtusely cuneate, glabrous surface. Midrib – rounded at lower surface, grooved at upper surface near to base. Lateral nerves 8–10 pairs thin, indistinct near to apex and mixed with reticulation. Petiole – 0.8–1.3 cm long, grooved at upper surface, rounded at lower surface.

### Inflorescence

**Male Flowers:** Cyme inflorescence with usually three flowers and sometimes



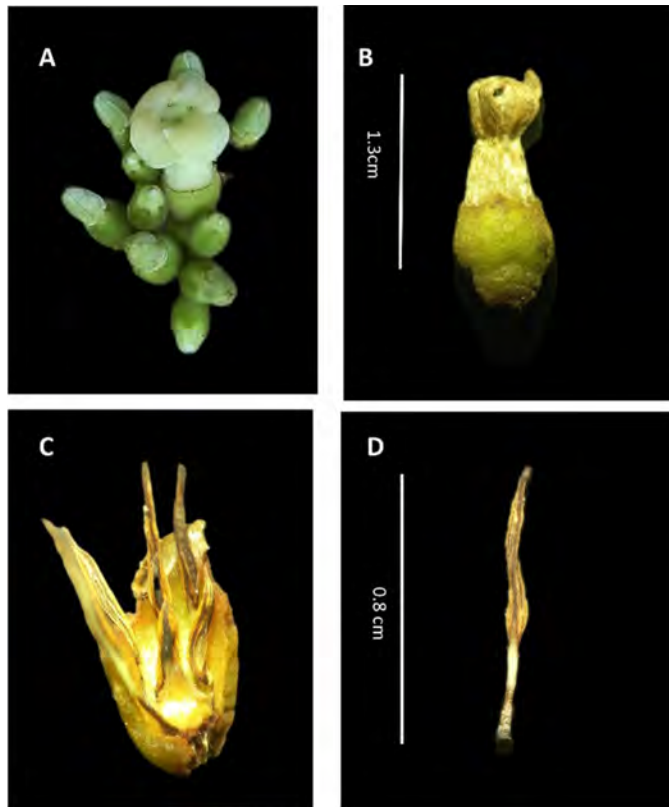
Map showing the distribution sites of *Diospyros crumenata*.



A–D—Leaf of *Diospyros crumenata*: A—Upper surface | B—Lower surface | C—Leaf base | D—Leaf apex. © Shashwathi H.S.

five flowers are born on leaf axils, hairy. Peduncle- 0.3cm long, with short hairs. Pedicel – hairy, 0.1 cm. Calyx – 0.5–0.6 cm campanulate, pale green colour hairy outside, 4-lobed, acute, valvate. It is

smaller in male flowers when compared with female flowers. Corolla – cream colour, 1.3 cm long, tubular and narrow at tip, hairy, 4 petals, twisted. Stamens 8–16 in number, free, 0.8 cm long. Anther – linear,



A—Male inflorescence | B—Male flower | C—Stamens with Pistillode | D—Stamen. © Shashwathi H.S.

shaped, broad, hairy, pale green colour, 4-lobed, folded outwards, valvate. Corolla-cream colour, 1–1.4 cm long, tubular, 4 petals, hairy, twisted. Stamines – 8, unequal in length, 0.4–0.7 cm. Ovary – 8-celled, 1 ovule. Style – 4 with dense hairs. Fruit – 3–6 cm, globose, berry, green, hairs absent, hard, pulp is fleshy and fibrous, edible, persistent calyx. Seeds – 8, 2–2.5 cm, dark brown in colour.

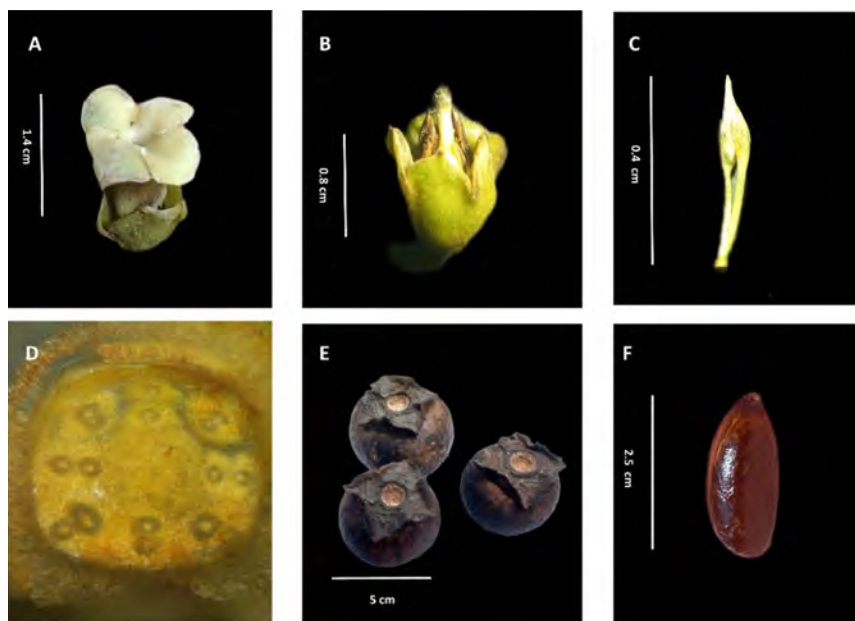
### Flowering and fruiting:

January–March

**Threats:** As they are Critically Endangered, the main threats to *D. crumenata* are, the low number of reproductively active trees, poor recruitment of seedlings, irregular flowering and fruiting, low seed viability, and consumption of the fruits by tribal people and by wild animals (Jose et al. 2023).

### Local conservation strategies

- These trees are commonly observed in sacred grooves which naturally conserve these trees.
- Prohibiting cutting of trees for agricultural implements may help in their conservation.
- Creating awareness among



A—Female flower: B—Stamines and gynoecium | C—Stamine | D—T.S. of ovary | E—Fallen Dried Fruits | F—Seeds. © Shashwathi H.S.

0.3–0.4 cm long. Pistillode – hairy and rudimentary.

**Female flowers:** Solitary

flowers at axils of leaf. Pedicel – 0.5–0.7 cm long, hairy.

Calyx – 0.7–1cm long, cup

local communities about these trees and encouraging to conserve them.

- Sustainable utilisation while using the fruits may help the trees for their reproduction and retaining their population.
- Including these trees in social forestry may helpful in conservation.

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## Corrigendum

**Aishwarya S Kumar (2023).** Memoirs of a *Pahadi* Adventure. *Zoo's Print* 38(9): 9-11; <https://zoosprint.org/index.php/zp/article/view/7646/6901>

The news update published in *Zoo's Print* 38(9): 9-11 “Memoirs of a *Pahadi* Adventure” <<https://zoosprint.org/index.php/zp/article/view/7646/6901>> had the following issues:

i) p. 10. A picture of *Fagopyrum esculentum* was given with a caption that read “Phaphru (*Fagopyrum esculentum*), a local delicacy which I no longer have the heart to taste after learning that the plant’s invasive. © Aishwarya S Kumar.” It should be noted that this plant species was wrongly mentioned as invasive in the article. It is in fact introduced.

ii) p. 11. The sentence “For instance, *Fagopyrum esculentum* (or ‘Phaphru’, as it’s called in Chambyali, the local dialect) holds cultural significance and is used to make a local delicacy.” Does not hold true the context. The plant is an introduced species to the region, not invasive.