

***DIOSPYROS UDAIYANII* (EBENACEAE), A NEW SPECIES FROM WESTERN GHATS, INDIA**

P.S. UDAYAN¹, A.V. RAGHU², S. NOORUNISA BEGUM³ AND A.K. PRADEEP⁴

Research Centre & P. G. Department of Botany, Sree Krishna College, Ariyannur 680102, Guruvayur, Thrissur, Kerala, India

Keywords: Kakkayam; Ebenaceae; *Diospyros*; New species; Western Ghats.

Abstract

Diospyros udaiyanii, a new species from Kakkayam forest of Malabar Wildlife Sanctuary, Western Ghats of Kerala, India is described and illustrated. It is closely allied to *D. pilosiusculata* G. Don. in its stunted habit, smaller, glabrous leaves and large broad 4 or 5 glabrous calyx lobes with long pedicel, the absence of tomentose hairs on twigs, petiole, pedicel, calyx and leaf margin.

Introduction

The genus *Diospyros* L. belonging to the family Ebenaceae is mostly confined to the tropics (Mabberley, 2008). A total of 607 species have so far been reported, of which ca 300 species occur in Asia and the Pacific area, 98 species in Madagascar and the Comoro Islands, 94 species in African Mainland, ca 100 species in America and 15 species in Australia (Wallinifer, 2001). In India, *Diospyros* is represented by 66 taxa, including five varieties (Singh, 2008). From the state of Kerala, Nayar *et al.* (2006) reported 34 taxa.

During the course of floristic exploration along the evergreen forests of Kakkayam, Western Ghats of Kerala in South India, the authors collected some interesting specimens of *Diospyros* with one population of four trees and only one tree with flowers. The specimens were critically studied and compared with other described species from India and Sri Lanka, but none of them matched with the collected specimens. The closely related species to the collected specimen is *D. pilosiusculata* G. Don., an endemic species restricted to eastern India and found distributed in West Bengal, Assam, Manipur, Meghalaya, Nagaland and the Andaman and Nicobar Islands. The collections being unmatched with any of the known species so far described hitherto (Wallinifer, 2001; Singh, 2008), it is described here as *Diospyros udaiyanii* sp. nov. The differences between the new species with the allied *D. pilosiusculata* are shown in Table 1.

***Diospyros udaiyanii* P.S. Udayan, sp. nov.**

(Figs 1 & 2).

Diagnosis: *Diospyros udaiyanii* can be distinguished from *D. pilosiusculata* for its smaller height, long pedicel, and bright yellow, globose hairy solitary fruits, absence of tomentose hairs on twigs, petiole, pedicel, calyx and leaf midrib and margin, smaller, glabrous leaves, and large broad 4 or 5 glabrous calyx lobes.

¹Email: psudayan@rediffmail.com

²Corresponding author. Kerala Forest Research Institute (KFRI), Peechi 680 653, Thrissur, Kerala, India. Email: avraghu@kfri.res.in

³Indian Institute of Ayurveda and Integretative Medicines (I-AIM); Foundation for Revitalisation of Local Health Traditions (FRLHT); No. 74/2, Jarakabande Kaval, Attur 560 064, Bangalore, Karnataka, India.

⁴Department of Botany, University of Calicut - 673635, Malappuram, Kerala, India.

Table 1. Diagnostic morphological characters of *Diospyros udaiyanii* sp. nov. and its closely related *D. pilosiusculata*.

| Characters | <i>D. udaiyanii</i> sp. nov. | <i>D. pilosiusculata</i> |
|------------|---|--|
| Habit | Small trees (6 m) | Trees (8 m) |
| Branchlets | Glabrous | Densely tomentose |
| Petiole | Glabrous | Pubescent |
| Calyx | 15 mm long, glabrous; lobes 4 or 5, ovate-lanceolate, acute, spreading, valvate | 5–10 mm long, pubescent outside, glabrous within; lobes 4, lanceolate, ciliate |
| Peduncle | 4–8 cm long, glabrous | 0.6–1.0 cm long, pubescent |

Fig. 1. *Diospyros udaiyanii* P.S. Udayan, **sp. nov.** A. Habit; B. Fruits.

Types: India, Kerala, Kozhikode district, Malabar Wildlife Sanctuary, Kakkayam, about 750 m, 27 May 2011, P.S. Udayan & Noorunisa Begum 110834 (*Holotype*: MH; *Isotypes*: SKC, CALI, FRLH).

Paratype: India, Kerala, Kozhikode district, Malabar Wildlife Sanctuary, Kakkayam about 750 m, 08 May 2012, P.S. Udayan & A.V. Raghu 27801 (KFRI).

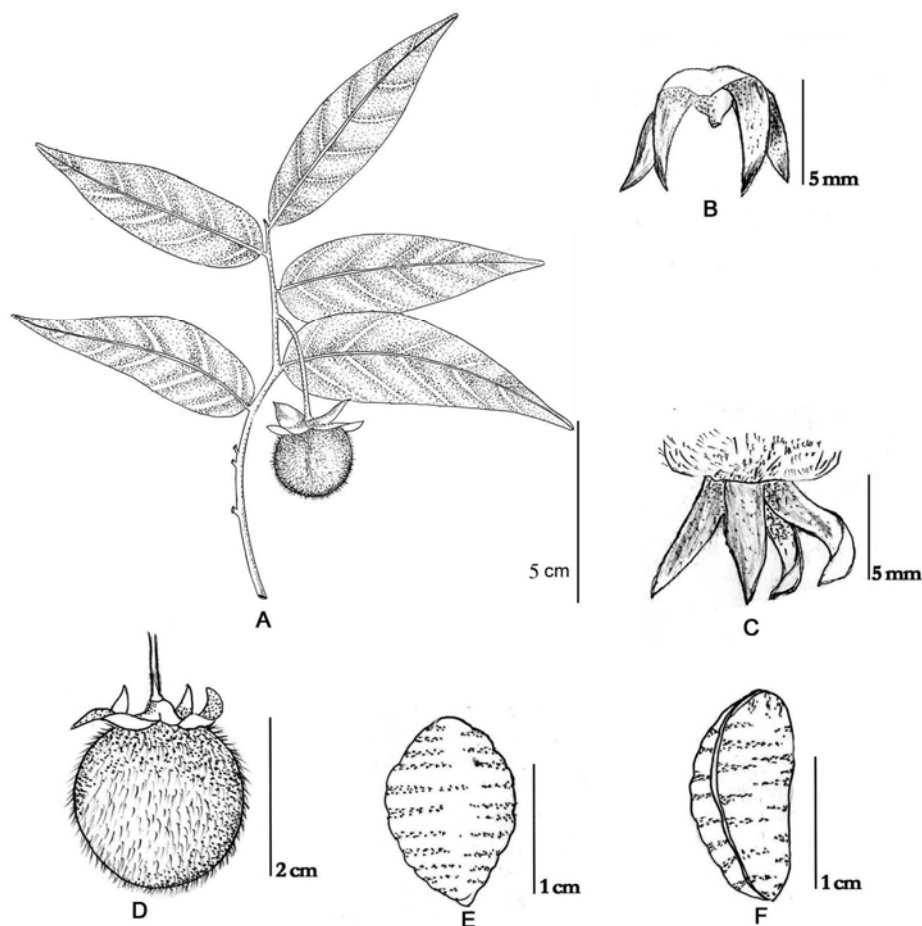


Fig. 2. *Diospyros udaiyanii* P.S. Udayan, **sp. nov.** A. Habit (from P.S. Udayan 110834); B & C. Fruiting calyx; D. Fruit with calyx; E & F. Seeds.

Small dioecious trees, up to 6 m tall with smooth blackish bark, yellowish-brown inside, young branches glabrous. Leaves alternate, bifarious, 8–15 × 1.5–4.0 cm, oblong or lanceolate, abruptly or long acuminate at apex, rounded or cuneate at base, thinly coriaceous, glabrous, canaliculate; lateral nerves c. 9 pairs, oblique towards apex, prominent beneath; petioles 3–5 mm long, terete, glabrous. Male flowers not seen. Female flowers solitary, axillary, borne on young and old shoots, ebracteate; pedicels glabrous, terete, articulated at the apex with flowers. Calyx campanulate, glabrous; lobes 4 or 5, ovate-lanceolate, c. 1.5 cm long, acute, spreading, glabrous, valvate. Corolla tubular, 5–8 mm long, silky outside, glabrous within, deeply 4-lobed; lobes lanceolate, contorted. Staminodes absent. Ovary globose, densely hairy, 4-locular, ovule 1 in each

locule; style 1, short, covered with hairs; stigmas 2, glabrous. Fruiting calyx deeply lobed, without conspicuous tube at base, fruit seated on a very small disc of flat tube; lobes flattened, lanceolate, 2.5×1.5 cm across, enlarged, glabrous within, long ciliate, rigid, reflexed, not touching the fruit, without dilated margin veined. Fruits 2.5–3.0 cm in diameter, globose, densely rufous hairy; fruiting pedicels 4–8 cm long, glabrous. Seeds few, 2×1 cm; endosperm equable. Male plants not known.

Phenology: Flowering from January to June; fruiting from July to August.

Etymology: The specific epithet of the new taxon is in honor of Dr. K. Udayan, Professor (Retd.), Department of Botany, Bharathiar University, Coimbatore, Tamil Nadu for his valuable contributions to the fields of Microbiology, Taxonomy and Plant Pathology.

Distribution: So far known only from Malabar Wildlife Sanctuary, Kakkayam forest ($11^{\circ} 33'$ N, $75^{\circ} 55'$ E) in the Kozhikode District, Kerala, India. Only one population of the species with four trees were found, does not face any threat as it occurs within an elephant reserve (Malabar Wildlife Sanctuary).

Habitat: The species grows in shady, moist places as undergrowth in evergreen forests at about 750 m above sea level. This species is found growing along with other species, namely, *Alseodaphne semecarpifolia* Nees, *Elaeocarpus tuberculatus* Roxb., *Humboldtia brunonis* var. *raktapushpa* P.S. Udayan, K.V. Tushar & Satheesh George, *Orophea sivarajanii* Sasidh., *Polyalthia coffeoides* (Thw. ex Hook. f. & Thoms.) Hook. f. & Thoms., *Syzygium grande* (Wight) Walp., *Syzygium laetum* (Buch.-Ham.) Gandhi and *Vateria indica* L.

Conservation status: *Diospyros udaiyanii* can be categorized as Near Threatened (NT) based upon IUCN (2012).

Acknowledgements

The authors are grateful to Dr. M. Sanjappa, Botanical Survey of India (BSI), Kolkata; Dr. G.V.S. Murthy, Botanical Survey of India (BSI), Coimbatore; and Dr. N. Sasidharan, Kerala Forest Research Institute, Thrissur for their help. They are also thankful to Department of Science & Technology, New Delhi and Kerala State Council for Science, Technology & Environment, Thiruvananthapuram for the financial support, and Prof. D. Jayaprasad of Sree Krishna College, Guruvayur, Kerala, India for encouragement. The facilities provided by the Kerala Forest Department for the field work are thankfully acknowledged. The illustrations were done by Smt. Sajeena M.U., Sree Krishna College, Guruvayur. The third author is highly indebted to the Advisor, Foundation for Revitalisation of Local Health Traditions, Bangalore for providing facilities and the second author expresses his gratitude to the Director, Kerala Forest Research Institute, Peechi, Kerala for encouragement.

References

- IUCN 2012. Guidelines for Application of IUCN Red List Criteria at Regional and National Levels: Version 4.0. Gland, Switzerland and Cambridge, UK.
- Mabberley, D.J. 2008. Mabberley's Plant Book: A portable dictionary of plants, their classification and uses. 3rd edition. Cambridge University Press, Cambridge, pp. 208–211.
- Nayar, T.S., Beegam, A.R., Mohanan, N. and Rajkumar, G. 2006. Flowering Plants of Kerala - a Hand Book. TBGRI Publications, Thiruvananthapuram, 1069 pp.
- Singh, V. 2008. Monograph of Indian *Diospyros* L. (Persimmon, Ebony) Ebenaceae. Botanical Survey of India, Kolkata, pp. 8–9.
- Wallinofner, B. 2001. The biology and systematics of Ebenaceae: a review. Ann. Naturhist. Mus. Wien. **103**(2): 485–512.

(Manuscript received on 22 June 2015; revised on 17 September 2015)