



Taxonomical Note and Three new records of *Dioscorea* species to the flora of Periyar Tiger Reserve, Western Ghats, India

Padma Mahanti¹, Sabeela Beevi Ummalyama², Bikash Bhattarai³, Rajkumari Supriya Devi⁴, Nabin Kumar Dhal⁵, Sanjeet Kumar⁶✉

1. Directorate of Environment and Climate Change, Pettah, Thiruvananthapuram-24, Kerala, India
2. Institute of Bioresources and Sustainable Development, A National Institute under Dept. Biotechnology Govt. of India Imphal, Manipur, India
3. Biodiversity Conservation Division, Ambika Prasad Research Foundation, Sikkim, India
4. Biodiversity Conservation Division, Ambika Prasad Research Foundation, Sikkim, India
5. CSIR-Institute of Mineral and Material Technology, Bhubaneswar, India
6. Ambika Prasad Research Foundation, Bhubaneswar, India

✉Corresponding Author:

Ambika Prasad Research Foundation, Bhubaneswar, India
Email-Id: sanjeet.biotech@gmail.com

Article History

Received: 03 May 2018
Accepted: 17 June 2018
Published: June 2018

Citation

Padma Mahanti, Sabeela Beevi Ummalyama, Bikash Bhattarai, Rajkumari Supriya Devi, Nabin Kumar Dhal, Sanjeet Kumar. Taxonomical Note and Three new records of *Dioscorea* species to the flora of Periyar Tiger Reserve, Western Ghats, India. *Species*, 2018, 19, 44-47

Publication License



This work is licensed under a Creative Commons Attribution 4.0 International License.

General Note



Article is recommended to print as color digital version in recycled paper.

ABSTRACT

Three species of *Dioscorea* was recorded as new flora to the Periyar Tiger Reserve, Western Ghats, Kerala. The identified species are *Dioscorea hamiltonii*, *Dioscorea glabra* and *Dioscorea belophylla*. Taxonomy, distribution and associate flora of the identified species are provided for easy identification in field.

Keywords: Dioscoreaceae, New plant species, Kerala, Wild edible Plants

1. INTRODUCTION

India holds wide ranges of flora and fauna which covers more than 45,000 species of plant species. Out of that there are many species which are not found anywhere else and they are endemic to India. Many of under exploited flora of India is lies in four biodiversity Hotspots of India consists of Eastern Ghats, Western Ghats, Himalayan regions, and Indo-Burma biodiversity Hotspot. Western Ghats, popularly known as Sahyadri which is one of the 33 documented sensitive zones of the world with wide range of species diversity and has great economic potential too. Kerala states comes under Western Ghats. The floral wealth of Kerala comprised of about 11,840 taxa of plants, Among them dominant group is angiosperm comprised of 4968 taxa out of that 900 species are endemic to the region.

In Kerala, Periyar Tiger reserve (PTR) is one among 12 protected reserved forest area of the state, located at Idukki, largest district of Kerala. PTR is covering an area of 777 km² and largest sanctuary in Kerala. This area is well known for its scenic beauty, wildlife and diverse floral wealth. But the floral diversity of PTR is not exploited so far, and major part of this protected forest comes under Western Ghats with high percentages of endemism to the place. During the year 2016-2017 survey on floral diversity and establishment of relationship between food plants, prey and tigers. First and correspondence authors did many exploration to the Periyar Tiger Reserve. During the survey, Corresponding author found three species of *Dioscorea* from the tourism zones of Periyar Tiger Reserve. After literature survey and morphological characterization, it was confirmed that the collected species are *D. hamiltonii*, *D. glabra* and *D. belophylla* which are new records to the PTR. *Dioscorea* L., commonly known as Yam, which has potent economic value due to its edible tubers and its medicinal importance as a source of steroidal sapoins used in the industry for the synthesis of human sex hormones and cortisone (Kumar et al. 2017). Dioscoreaceae consists of 4 genera around about 650 species widely distributed in temperate and tropical regions throughout the world (Ting and Gilbert, 2000, Mabberley et al., 2017). From the Family Dioscoreaceae, most extensively distributed one is *Dioscorea* Linnaeus (1753: 1032) with wide range of species (Govaerts et al. 2007) and 50% known species are distributed especially in neotropics.

2. TAXONOMIC TREATMENT

Dioscorea hamiltonii

Hook.f. in Hook. f. Fl. Brit. India 6:295. 1892; Haines, Bot. Bihar & Orisa 3: 120(1171). 1924; Fischer in Gamble, Fl. Madras 3: 1512(1056). 1928; Prain & Burkill, Ann. Roy. Bot. Gard. (Calcutta) 14 (2):299. t. 122. 1938.

Stem twining to the right, it become reddish when dried, angled, occasionally subacute, and unarmed, frequently twisted; tubers are long – stalked, deep in underground. Bulbils 0. Leaves closely similar to *D. belophylla* but slightly blue – green and when dry the cross – nervules are less scalariform, opposite or subopposite, ovate, lanceolate or ovate – lanceolate, base cordate, subcordate – truncate or sagittate, 9 – 17 x 6 cm, acuminate, 7 – 9 nerved with 5 nerves reaching the apex and decurrent on petiole, secondary nerves close, rather regular and subparallel, upper leaves are smaller and narrower; petiole 3.0 – 6.5 cm long. Male spikes are short, 1-4 nate or subverticillate on slender axillary branchlets, 1.0 – 2.3 cm long with markedly zigzag rachis with a flower at each angle. Flower yellow, 1.2 mm long; buds are globose. Outer perianth - lobes ovate – oblong rounded, concave, and obscurely keeled, inner smaller, oblong, not thick. Stamens are long, 6 perfect. Female spikes axillary, 3.5 – 22.5 cm long. Flowers are larger compared to *D. belophylla*. Outer perianth – lobes very thick, crescentic, concave inside and with a very thick keel outside, attaining 2.5 mm length, inner lobes and with a very thick, oblong, only half to three – fourths as long. Capsule glabrous, retuse, wings distinctly margined. Seed winged all round.

Flowering: September – October

Fruiting: December – February

Distribution: Northern India, Thailand, Southern China and Taiwan to Southern Burma

Kerala State: Kannur, Thrissur, Malappuram, Wayanad, Periyar Tiger Reserve.



Figure 1 a: Scenic view of Periyar Tiger Reserve, b: *D. glabra*, c: *D. bellophylla*, d: *D. hamiltonii*

Dioscorea glabra

Roxb. Fl. Ind. 3:803. 1832; hook.f. in Hook.f. Fl. Brit. India 6:1892.; Haines, Bot. Bihar & Orissa 3: 1118 (1168). 1924; Fischer in Gamble, Fl. Madras 3:1512 (1056). 1928; Prain & Burkill, Ann. Roy. Bot. Gard. (Calcuta) 14 (2): 354.t.131. 19387; Burkill in Steenis Fl. Males. I. 4: 331. 1951.

Stem twining to the right, fairly glabrous, frequently with abundant prickles, sometimes quite unarmed; swollen at the nodes and with swollen petiole – bases (but these are not much hardened and aculeate as in *D. wallichii*) rhizome woody superficially proceed to long, stout, fleshy fibres ending in tubers; tubers are more or less cylindrical. Leaves opposite or lower alternate, variously shaped, commonly ovate – oblong, ovate, ovate – hastate, sometime glabrous, suborbicular, glaucous beneath, 5 – 9 ribbed, secondary nerves not scalariform between the costae, base cordate, those towards the inflorescence with base straight, rounded, truncate or sagittate – subcordate; petiole from half as long as to as the blade. Male spikes dense or lax, opposite or finally whorled on axillary rachises, long or in long terminal more or less leafless panicles; rachis always quite glabrous; bracts lanceolate, acuminate, about half as long as the perianth, base. Buds somewhat oblong – globose with very broad often pulvinate base. Flowers are yellowish, oblong or subglobose, 1.6 mm long. Outer perianth – lobes ovate – oblong, obtuse, gibbous at the base, inner obovate or oblanceolate,

very thick. Stamen 6 perfect. Pitillode very minute. Female rachis quite glabrous. Perianth quite sessile on ovary, 1.3 mm long. Capsules glabrous, subquadrate or obcordate. Seed winged all round.

Flowering: September – November

Fruit: November – March

Distribution: Thailand, Mainland south and south-east Asia from Nepal, northern India (lectotype) and southern China to peninsular Malaysia, also the Andaman Islands.

In India: Assam, Madhya Pradesh, Manipur, Punjab, Uttar Pradesh. Periyar Tiger Reserve, Kerala

Dioscorea bellophylla

Voigt. Ex Haines, For. Fl. Chota Nagpur 530. 1910 & Bot. Bihar & Orissa 3: 119 (1169). 1924; Fischer in Gamble, Fl. Madras 3: 1512 (1056). 1928; Prain & Burkill, Ann. Roy. Bot. Garg. (Calcutta) 1(2): 348. T. 127. 1938; Siddiqui, Fl. West Pakistan 53:3. 1973.

D. glabra auct. Non Roxb.: Hook.f. in Hook.f. Fl. Brit. India 6: 294. 1892, pro parte.

Stem quite smooth, twining to the right, enlarged at the base into a small rhizome bearing tuber at the ends of long fleshy fibres (as an *D. glabra*); tuber roughly turbinate or cylindrical but often irregular in shape and flattened. Bulbils linear or linear – clavate, brown, somewhat muricate. Leaves opposite and alternate, variable in shape and size, usually ovate or ovate – lanceolate, up to 35 cm long, deeply to shallowly cordate, the basal lobes often truncate so that the leaf look more or less hastate – oblong, acute to acuminate, glabrous, often 7 – 9 ribbed, dark blue- green beneath with scalariform secondary nerves; petiole long, slender, nearly always thickened and rigid or sublimate in the upper portion, base thickened and sometimes curled round a support. Male spikes 1.80 cm long, lax – flowered, not whorled but unilaterally 3 – nate on the rachis, usually branched and frequently copiously paniced, the panicle axillary, 10 – 17 cm long, more rarely on long slender leafless branches. Flowers broadly oblong, 1.2 mm long or less; bracts very short, ovate, cuspidate, appearing deflexed. Bases of perianth very broad, sessile, outer lobes free, oblong, obtuse, dotted and with scarious margins, inner elliptic – oblong, nearly as long. Stamens on short column. Capsule suborbicular.

Flowering: September – November

Fruit: January – March

Distribution: Bhutan, Indonesia, Laos, Cambodia, Malaysia, Myanmar, Thailand, and Vietnam and India, Periyar Tiger Reserve, Kerala

ACKNOWLEDGEMENTS

Authors are thankful to the forest officials, Kerala Forest & Environment Department, Kerala and local communities, forest guards and guides of Periyar Tiger Reserve, Kerala.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCE

1. Kumar S, Das G, Shin HS. & Patra JK. 2017. *Dioscorea* spp. (A Wild Edible Tuber): A Study on Its Ethnopharmacological Potential and Traditional Use by the Local People of Similipal Biosphere Reserve, India. *Frontiers in Pharmacology* 8, 1-17.
2. Mabberley, D.J. 2017. *Mabberley's Plant-Book: A portable dictionary of plants, their classification and uses*. Fourth Edition. Cambridge University Press, Cambridge.
3. Ting, C. & M.G. Gilbert 2000. *Dioscorea* L. In: Wu, Z.Y. & P.H. Raven (eds.), *Flora of China*. Vol. 24. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. pp. 276–297.
4. Govaerts, R., P. Wilkin, and R. M. K. Saunders. 2007. *World checklist of Dioscoreales: yams and their allies*. Kew: Royal Botanic Gardens.