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A note on *Dioscorea pubera* Blume

Sanjeet Kumar[1] and Rakhee Dimri[2]

1. Biodiversity & Conservation Lab., Ambika Prasad Research Foundation, Odisha, India
2. Department of Botany, VSKC Government PG College, Dakpathar, Dehradun, Uttarakhand, India
*Corresponding author's email-Id:dimri.rakhi@gmail.com

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ABSTRACT

Dioscorea pubera shows the geographical variations. It also indicates the elevation of a landscapes. It is used as a food and medicines. Therefore, keeping this in view an attempt has been made to document its variations in different landscapes along with uses. The photographs and taxonomical note is provided for easy identification.

Dioscoreaceae R.Br., commonly known as 'Yam family', is a monophyletic group of monocotyledonous plants and belongs to Dioscoreales Mart. order together with Burmanniaceae Blume and Nartheciaceae Fr. ex Bjurzon (Caddick et al. 2002 a,b). The family has pantropical distribution (Knuth 1924) and is composed by the genera *Dioscorea* Linnaeus (1753: 1032), *Stenomeris* Planchon (1852: 319), *Tacca* J.R. Forster & G. Forster (1775: 35), and *Trichopus* Gaertner (1788: 44) (Caddick et al. 2002).

The genus *Dioscorea* have mainly tropical distribution with some species along temperate areas (Knuth 1924) and is traditionally recognized as the most diverse genus within the family Dioscoreaceae with ca. 625 species (WCSP 2018) split into 10 major clades (Viruel et al. 2015). The genus species inhabit forest margins and open areas up to 3500 m

above mean sea level (Arackal and Pandurangan 2015) and are typically characterized by dioecious twiners, small flowers with 3 petals and 3 sepals undifferentiated or weakly differentiated, seeds usually winged, inferior ovary, and usually by tuber or rhizome organ (Hills et al. 2018).

In India, about 91 species (Ummalyma et al. 2018) of *Dioscorea* are recognized, 21 of than distributed in Western Ghats region (Arackal and Pandurangan 2015, Sheikh and Kumar 2017). According to Mehrotra & Shukla (2019), in a palaeoecological study of *Dioscorea*, many plant genera prevented extinction in the Paleogene by migrating to Western Ghats, where there are still humid climatic conditions. This may explain the biodiversity of *Dioscorea* in that region and reinforces the importance of taxonomic studies and fieldwork in that area.

During the survey works on the floral diversity of India under various projects, collected many *Dioscorea* species (Kumar et al. 2017) from hotspots of India (Western Ghats, Eastern Ghats and Himalayan regions). Authors observed variations on the morphology of *Dioscorea pubera*. The morphology of this known species and variations are noted down below.

Morphology: Herbaceous climber up to 150 cm long. Stem twining to the right, pubescent and densely covered with brown doted hairs, unarmed, fibrous and woody, ca. 4–6 mm thick; rootstock woody and densely tomentose producing whitishor yellowish tuber; tuber 10–15 ×2–3, cylindrical, white-yellowish when cut. Leaves are alternate at base and then opposite, 6.5–6.8 × 7.3–7.4 cm, ovate or sometimes orbicular, base cordate, entire, acute with 7 clear costae and brownish green and light green beneath, leaf surface have brown hairs, 4 most exterior lateral veins terminating half way to margin, the 3 inner-most veins terminating at the apex. Petiole, 7.0 × 0.2–0.4 cm, slender, pubescent, brown hairs at base. Internodes thickened with brown dotted hairs. Male inflorescence composed of many cymules arranged in racemes, slender, axillary. Staminate flowers ca 1.5 mm long, green with small bract, receptacle cupuliform, imbricate in bud, anther basifixed. Female inflorescence is spike with 15–25 flowers, up to 15 cm long, floral bracts at the base, ovate, 0.8–1.0 × 0.4–0.5 mm, hairy, apex acuminate, present at the base of the cymule, with brown hairs, pistillate, 3 mm long, 2 mm wide, staminodia 6, triangular. Spike are hairy. Pedicle 0.6–1.1 mm long. Capsule are hairy and yellowish green, 1.0–2.8 × 2.5–2.9 cm, almost translucent when mature. Seeds are winged at periphery (Figure 1 & 2).

Flowering and fruiting:—The species was collected with flowers and fruits from August to September.

Notes on key characters of *Dioscorea pubera*:—The important observed key characters are the stems twinning to right, pubescent and unarmed stems, sometimes observed absence of bulbils, hairy spikes, green flowers with ovate bracts, hairy and yellowish green capsules, and the seeds are winged.

Among the species of the genus, *D. pubera* is morphologically related to *D. alata* Linnaeus (1753: 1033), *D. bulbifera* Linnaeus (1753: 1033), *D. pubera* Blume (1827: 21) and *D. wallichii* Hooker (1892: 295) by the glabrous (except by *D. padmii*) and simple leaves, with often alternate phyllotaxis, stems twining to right (except by *D. buldifera*), and by the tubers varying among cylindrical and globose. The detailed differences of these species can be found in Table 1. *Dioscorea pubera* is native to the Indo-China region (Kumar et al. 2017) and distributed throughout the temperate, tropical Americas, China, wet regions of Himalayas and are used as a food & tonic by the tribal communities of India.

Table 1: Comparison of morphological features between *Dioscorea pubera* and their relatives.

Character	***D. alata***	***D. bulbifera***	***D. pubera***	***D. wallichii***
Stem twining	Twining to right	Twining to left	Twining to right	Twining to right
Stem	Tomentose , 4-angled stem	Glabrous and woody stem	Tomentose	Woody & glabrous
Leaf phyllotaxis	Alternate/Opposite	Alternate	Alternate	Alternate/Opposite
Leaf morphology	Elliptic, base deeply cordate, apex shortly acuminate	Broadly ovate, base cordate, Apex acuminate	Broadly elliptic or broadly ovate, base cordate, Apex amuminate	Ovate-oblong, base sagitade, apex acute
Leaf indumentum	Glabrous	Glabrous	Glabrous	Glabrous
Flower	Female spikes solitary or 2 or 3 together	Male flower Green or purplish and female spikes slender drooping	Male spikes pubescent and female spike densely pubescent	Male spikes female spikes panicled
Bulbils	Present	Present	Present	Absent

Tuber	Not single, deep, globose or conical (when cork brown or purplish black	Single. Not deep, subglobose without defined stalk.	Long cylindrical tuber	Numerous fascicled long, deep.
Distribution	Wide	Wide	Wide	Wide

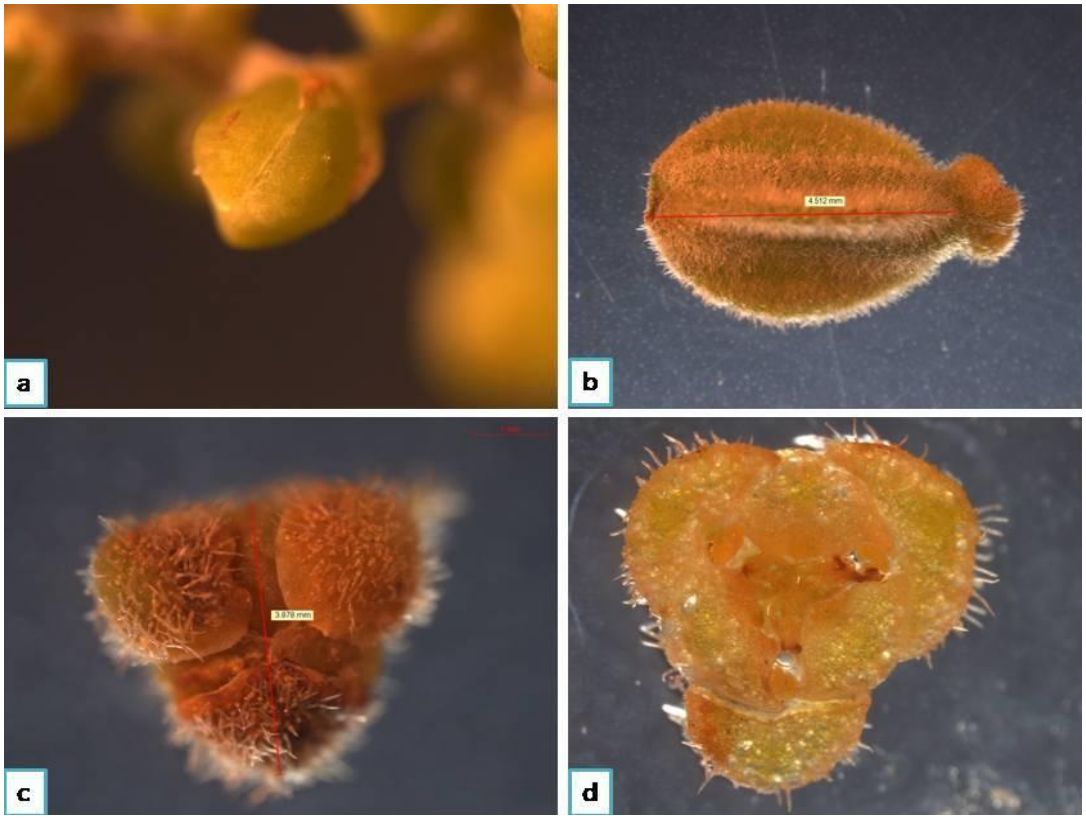

Figure 1: *Dioscorea pubera*, a: bud, b: fruit, c: flower, d: section of immature ovary

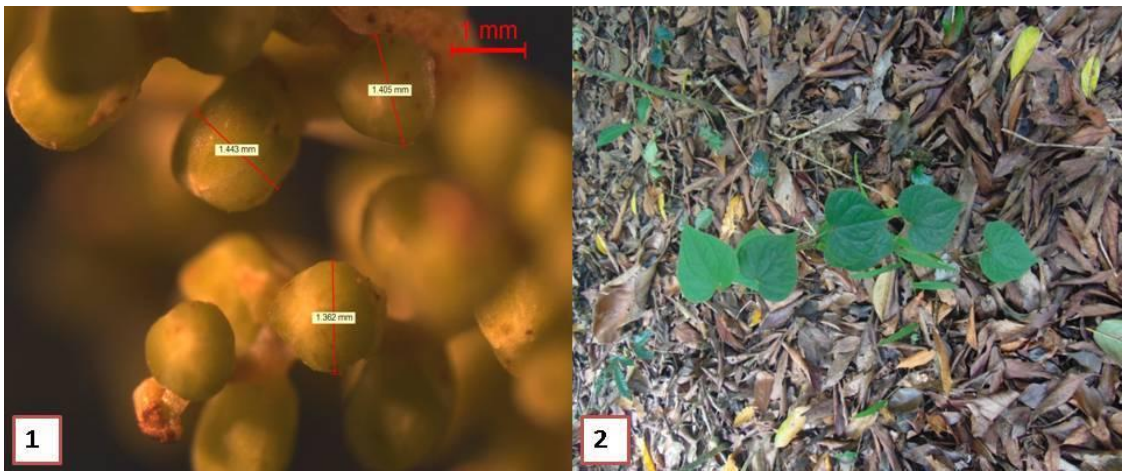

Figure 2: Flower buds and collected plant in wild

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