



Disporum mishmiensis (Colchicaceae), a new species from North East India

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Key words

Arunachal Pradesh
Disporum
India
Mishmi Hills

Abstract *Disporum mishmiensis*, sp. nov. is described from Arunachal Pradesh, north-eastern India. A detailed description and colour photographs of *D. leucanthum* are provided to aid identification. A distribution map, notes on ecology and a key to Indian species are provided.

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INTRODUCTION

The eastern Himalaya of north-eastern India includes one of the least studied biodiversity hotspots in the world (Myers et al. 2000). The region has received some attention from foreign plant collectors during the 18th and 19th century. Griffith's explorations through Assam and Arunachal Pradesh and Frank Kingdon-Ward's botanical collections resulted in numerous novelties in the eastern Himalaya. Major hindrance for field exploration include topography, monsoon resultant landslides, insurgency and inaccessibility into more remote regions and higher elevations.

While conducting floristic expeditions to north-eastern India, MS and VSH collected an unknown *Disporum* Salisb. (Colchicaceae) near Tohangam view point, on the way to Hayuliang from Tezu, Lohit district of Arunachal Pradesh. Detailed study of literature (Hara 1972, 1984, 1988, Liang & Tamura 2000, Dasgupta 2006), herbarium, and live specimens revealed that the specimen shares similarities with the sympatric *D. leucanthum* Hara but shows distinct differences in plant size, absence of rhizomes, perigone morphology and colour (Table 1). Hence, we describe these collections as new to science below.

Disporum is a small genus of about 30 species (WCSPF 2018) with several recent novelties having been added to the genus (Li et al. 2007, Hu et al. 2016, Zhu et al. 2016). Nearly half of the recognized species are endemic to China (Liang & Tamura 2000). In India the diversity has been underestimated and the recent Fascicle of the Flora of India: *Liliaceae*, Dasgupta (2006) subsumed all Indian taxa under a broadly circumscribed *D. cantoniense* (Lour.) Merr., even the highly distinctive *D. le-schenaultianum* D. Don and *D. leucanthum* which have terminal inflorescences. Our experience based on field and herbarium studies revealed that the diversity of *Disporum* in India and the adjacent regions of the eastern Himalaya is under-appreciated and it requires a thorough revision.

Disporum mishmiensis Hareesh & M. Sabu, sp. nov. —

Fig. 1; Map 1

Disporum mishmiensis is similar to *D. leucanthum* but differs from it in having a campanulate perigone with pink tepals that are 2.7–3 cm (vs 1.2–2 cm), filaments 14–16 mm long (vs 8–15 mm), a style 16–18 mm long (vs 6–12 mm), and a non-stoloniferous/rhizomatous growth habit. — Type: M. Sabu & V.S. Hareesh 149366 (holo CALI; iso CAL, CALI), India, Arunachal Pradesh, Lohit District, near Tohangam view point, on the way to Hayuliang from Tezu, N27°55'10.94" E96°20'14.014" [27.919647, 96.337156], 16 May 2017.

Etymology. The name *mishmiensis* denotes the type locality, Mishmi Hills which is a part of the eastern hills of Arunachal Pradesh adjacent to Myanmar.

Bisexual perennial herb, evergreen. *Rhizome* short, internodes < 0.5 cm, essentially caespitose, clump-forming. *Cataphylls* 1 or 2, papery, brownish pink, sheathing the lower stem. *Stem* occasionally simple or 2- or 3-branched distally, 50–150 cm high, glabrous. *Petiole* 0.5–1.2 cm long; leaf blade ovate to elliptic or elliptic lanceolate, 5–16 by 1.5–5 cm, acute to acuminate at the apex, cuneate at the base, glabrous, 5–7-nerved. *Inflorescences* terminal, 5–7-flowered; flowers 2.5–3 cm long, campanulate, pedicels 2.6–2.8 cm long, not ridged, glabrous, pale green. *Flowers* narrowly campanulate, opening to 1.5 cm wide, tepals pale pink, oblanceolate, 2.7–3 by 0.7–0.8 cm, acute at the apex, narrowed in the lower part, navicular-scapoid, 1 mm long, minutely papillate on the lower margin and abaxially, only slightly saccate at the base. *Stamens* distinctly shorter than the tepals, 16–20 mm long; filaments 14–16 mm long, dilated proximally and about twice the diameter as the distal portion, minutely papillate proximally; anthers 5–6 mm long. *Ovary* obovoid, 5–5.5 by c. 3 mm long. *Style* slightly shorter than tepals, 16–18 mm long, trifid at the apex.

Phenology — Flowering: May to June; fruiting: June to October.

Habitat & Ecology — *Disporum mishmiensis* is known only from Tohangam, Lohit district of Arunachal Pradesh (Map 1). The area is characterized by subtropical evergreen forest at moderate elevations (1 000–1 500 m). The new species grows along the open waysides in association with *Didymocarpus moellerii* A. Joe, Hareesh & M. Sabu (*Gesneriaceae*), *Elatostema* sp. (*Urticaceae*), *Impatiens arguta* Hook.f. & Thomson and *I. citrina* Hook.f. (*Balsaminaceae*), *Ophiorrhiza* sp. (*Rubiaceae*), etc.

Conservation assessment — Due to the known limited area of occurrence of *D. mishmiensis* which is less than 1–2 km²

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Fig. 1 *Disporum mishmiensis* Hareesh & M.Sabu. a. Habit; b. single flower; c. flower showing stamen and carpel; d–e. tepals adaxial and abaxial view; f. carpel; g. stamen (M. Sabu & V.S. Hareesh 149366). — Scale bars: a = 5 cm; b–f = 1 cm; g = 5 mm. — Photos by M. Sabu and V.S. Hareesh.

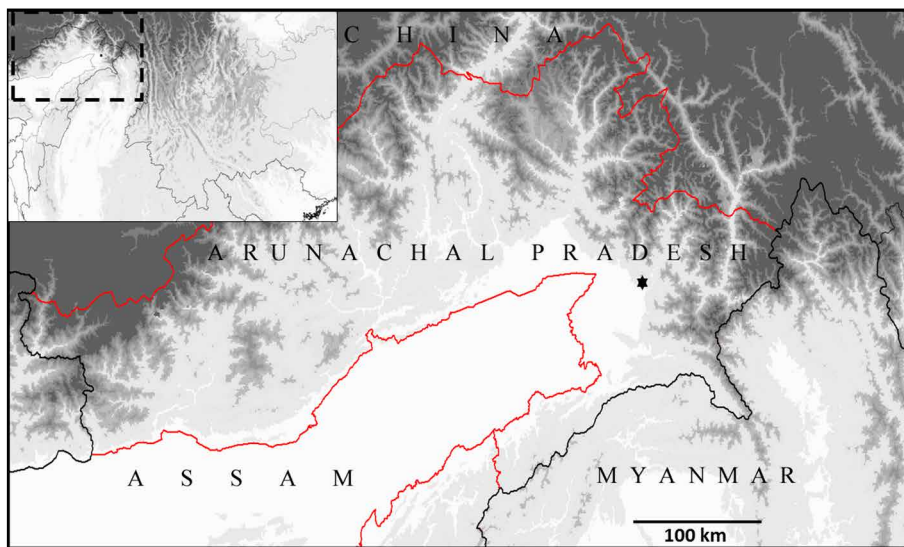
based on a grid centred on the known population, the species would fall under the category Threatened based on IUCN (2017) criteria, but due to its recent discovery and limited field exploration we prefer to tentatively classify *D. mishmiensis* as Data Deficient (DD) until further field studies can be performed. The major threat we observed is construction work for the Trans-Arunachal and Frontier Highway projects and shifting cultivation practices may lead to the decrease of the population in future.

Notes — *Disporum mishmiensis* is a distinctive new species from an underexplored, but diverse region of north-eastern India. This species differs from its most similar congener, *D. leucanthum*, in multiple characters (Table 1). *Disporum mishmiensis* is a larger, typically branched caespitose plant with terminal inflorescences of 5–7 pink flowers. AF has observed in *D. leucanthum* in the East Siang District of Arunachal Pradesh that it has an unbranched stem with 1 or 2 terminal white flowers in large rhizomatous colonies (Fig. 2). Furthermore, the two species differ in their habitat preference and elevation; *D. mishmiensis* occurs below 1800 m in subtropical forest whereas *D. leucanthum* prefers 1900–2100 m in subtemperate oak forest.

In addition, *D. mishmiensis* differs from *D. cantoniense* in its evergreen stems (vs deciduous), terminal inflorescences (vs pseudoaxillary), smooth peduncle and pedicels (vs scabrous) and purple pink flowers (vs purple). *Disporum cantoniense* var. *sikkimense* Hara is distinguished by its large perianth that

is greenish white (Hara 1984). In comparison to *D. mishmiensis* it has scabrous-papillose tepal margins, shorter staminal filaments, smaller anthers, a longer style and it occurs further west where it is documented only from Sikkim (Hara 1984). Hara (1984) had compared *D. cantoniense* var. *sikkimense* to *D. megalanthum* F.T.Wang & Tang, but the latter species differs from the former and from *D. mishmiensis* in its axillary inflorescences borne in the proximal part of the stem, typically at the leaf below the first branch, has larger stamens that are 20–28 mm long (vs 16–20), and is also rhizomatous (vs caespitose). Moreover, the closest populations of *D. megalanthum* occur approximately 300 km east of the only known locality of *D. mishmiensis*. The presumed closest relative of *D. mishmiensis* is the sympatric *D. leucanthum* from which *D. mishmiensis* differs in numerous characters discussed above and present below (Table 1). The key below serves to distinguish *D. mishmiensis* from other Indian species of *Disporum*.

The systematics of *Disporum* in India is in need of revision and it is clear from morphological and field observations that several species occur in north-eastern India rather than only *D. cantoniense* (Dasgupta 2006). AF has observed *D. cantoniense* in China and it is a deciduous species whereas most Indian plants observed are evergreen in habit. For taxonomy of Indian *Disporum* we recommend Hara (1984, 1988) until a synthetic systematic revision using molecular, cytological, and morphological data has been performed. A key to the species for India and adjacent regions of the Himalaya is provided.



Map 1 Collection locality of *Disporum mishmiensis* Hareesh & M.Sabu (★) in India. Inset showing the north-eastern part of India and adjacent countries. The larger map shows the single occurrence of *D. mishmiensis* in eastern Arunachal Pradesh. The border of Arunachal Pradesh and China and other India states is outlined in red.

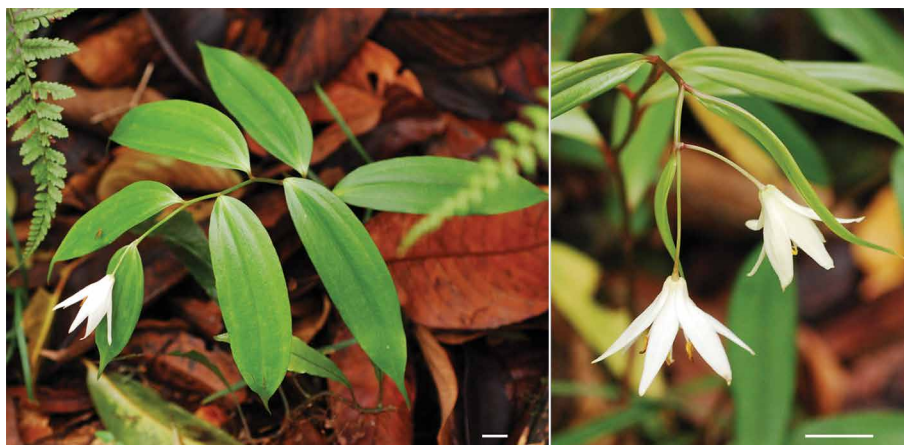


Fig. 2 *Disporum leucanthum* Hara in Arunachal Pradesh, East Siang District, at 2000 m elevation showing the unbranched stem and 1 or 2 white open-campanulate terminal flowers. — Scale bars = 1 cm. — Photos by A. Floden.

Table 1 Morphological comparison of *Disporum mishmiensis*, *D. leucanthum*, and *D. megalanthum*. Data from herbarium specimens and from Hara (1972, 1984, 1988).

Characters	<i>Disporum mishmiensis</i>	<i>Disporum leucanthum</i>	<i>Disporum megalanthum</i>
Rhizome	Caespitose, internodes < 0.5 cm	Rhizomatous/stoloniferous, internodes > 2 cm	Rhizomatous
Stem	1–3-branched	1(–2)-branched	1–2-branched
Inflorescence perigone	5–7-flowered, terminal Pink, narrowly campanulate, to 1.5 cm wide	1–2(–4)-flowered, terminal White, broadly campanulate, to 2 cm wide	4–8-flowered, axillary White, narrowly campanulate, to 3 cm wide
Tepals	2.7–3 cm long	1.2–2 cm long	2.5–3.8 cm long
Anther theca	Yellow when young	Purple when young	Yellow when young
Style length	16–18 mm	6–12 mm	12–18 mm

KEY TO THE DISPORUM SPECIES OF INDIA

Modified from Liang & Tamura (2000) with data from Hara (1972, 1984, 1988).

1. Inflorescences terminal on stem or branches 2
1. Inflorescences all or partly pseudo-lateral, terminal on short branches opposite a leaf 4
2. Perigone pink *D. mishmiensis*
2. Perigone white 3
3. Leaves with obvious cross-veins; tepals oblong or broad oblong, apex obtuse *D. leschenaultianum*
3. Leaves without obvious cross-veins, tepals broad ovate/narrow ovate/spathulate, apex acute *D. leucanthum*
4. Spur cylindric and often recurved, 4–8 mm long.
. *D. calcaratum*
4. Spur gibbous, 1–2 mm long. 5
5. Pedicels papillose-scabrous on ridges; perigone typically white or purplish *D. cantoniense*
5. Pedicels not papillose on ridges; perigone green-white. . .
. *D. cantoniense* var. *sikkimense*

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