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RESEARCH ARTICLE

A synopsis of the genus *Amischotolype* (Commelinaceae) in India with one new record, *A. monosperma* (C.B. Clarke) I.M. Turner from Andaman & Nicobar Islands and lectotypification of *A. hookeri* (Hassk.) H. Hara.

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Abstract

A synopsis of the genus *Amischotolype* in India is presented. *A. monosperma* (C.B. Clarke) I.M. Turner (Commelinaceae), collected from the Campbell Bay Biosphere Reserve, Nicobar Islands is reported here as a new addition to the flora of India. Since a type was not designated by Hasskarl while describing *A. hookeri*, a lectotype is designated here based on a Hooker & Thomson material from Khasia housed at L. Brief description and illustration of *A. monosperma* and colour photographs of all except *A. dolichandra* are provided.

Introduction

Amischotolype Hassk. (Commelinaceae) is a paleotropical genus with 22 species in the world (Duistermaat, 2012). It is easily recognized from all other genera of Commelinaceae by its unique inflorescence comprising of sessile glomerules of flowers. Karthikeyan *et al*. (1989) recorded three species in India, namely *A. hookeri* (Hassk.) H. Hara, *A. mollissima* (Blume) Hassk. and *A. tenuis* (C.B. Clarke) R.S. Rao. Duistermaat (2012) in her world revision recognized 3 species in India, *A. glabrata* Hassk., *A. hookeri* and one new species *A. dolichandra* Duist., endemic to north east India but ruled out the occurrence of *A. mollissima* and *A. tenuis* in India. Nandikar and Gurav (2014), following Duistermaat (*l.c.*), maintained these three species in their treatment.

During a field exploration to Andaman and Nicobar group of Islands in 2010, the authors had collected an interesting vegetative specimen of this genus from Campbell Bay Biosphere Reserve. This specimen was planted in the Botanical Garden of St. Joseph's College, Kozhikode and flowered in 2012 March. The plant is moderately large and erect with a branched creeping rhizome, bullate lamina, inflorescence originating from the creeping portion and hairy stamens. Since the specimens were not matching with any of the species described from India, they were referred to Dr. Helena Duistermaat (The Nederlands Herbarium) and identified as *A. monosperma* (C.B. Clarke) I.M. Turner (personal communication dated 20 August 2014). The species was so far reported to occur in Myanmar, Thailand, Peninsular Malaysia and Borneo (Duistermaat, 2012) and thus the present collection forms the first report of this species from India. Now, the genus is represented by four species in India, including the present species.

While studying the taxonomy of *Amischotolype* in India, we found that no type was designated for *A. hookeri*. It is lectotypified here in accordance with Article 9.2 of Melbourne Code (McNeill *et al*., 2012).

Materials and Methods

Field trips were conducted throughout India for the collection of specimens, especially the forest areas of North-East India and Andaman and Nicobar Islands. Photomicrographs of essential parts were taken by using Stereo microscope (Leica EZ4HD). Illustrations were made with the help of Camera Lucida attached to Stereo microscope. The identity of all the species was confirmed with type materials/protologue and nomenclature was updated with latest literature. In designating the lectotype, the guidelines of Article 9.2 of the Melbourne Code (McNeil *et al*., 2012) were followed. During the present study, the specimens deposited in ASSAM, CAL, CALI, MH, PBL and SKU were also examined.

Results

Key to species of *Amischotolype* in India

1a. Laminae bullate; inflorescences peduncled, produced on creeping stem…..***A. monosperma***
1b. Laminae not bullate; inflorescences sessile, produced on erect stem……...2
2a. Capsules exceeding from sepals, ovoid ……***A. hookeri***
2b. Capsules hardly exceeding from sepals, obovoid…….……..3
3a. Filaments pubescent; anthers elliptic, 0.6–1 × 0.5–1 mm……..***A. glabrata***
3b. Filaments glabrous; anthers linear, 3 × 0.7 mm……...***A. dolichandra***

Amischotolype dolichandra Duist., Gard. Bull. Singapore 64: 66. 2012; Nandikar & Gurav, J. Threat. Taxa 6: 5776. 2014. **Type**: India, Manipur, Karong, 1950, *Koelz* 26448 (holotype L!)

Distribution: India [Manipur, Meghalaya, Mizoram (Duistermaat, 2012)].

Ecology: Deep forests.

Notes: The epithet refers to the strikingly long anthers. This species most closely resembles *A. glabrata* but differs by characters in the key above.

Amischotolype glabrata Hassk., Flora 46: 392. 1863; Duist., Gard. Bull. Singapore 64: 66. 2012; Nandikar & Gurav, J. Threat. Taxa 6: 5776. 2014. *Forrestia glabrata* (Hassk.) Hassk., Flora 47: 630. 1864, Commelin. Ind. 94. 1870; C.B. Clarke, Commelyn. Cyrtandr. Bengal. 62. 1874, tab. XLII; Hooker f., Fl. Brit. India 6: 384. 1894. *Forrestia mollissima* (Blume) Koord. var. *glabrata* (Hassk.) Subba Rao & Kumari, Bull. Bot. Surv. India 12: 209. 1970. **Type**: Java, Ungaran prope Medini, *Junghuhn s.n.* (lectotype: L0041658!, designated by Duistermaat, 2012). **Fig. 1, A1-A4.**

Distribution: Pakistan, India (Assam, Meghalaya, Sikkim, West Bengal), China, Taiwan, Japan, Vietnam, Myanmar, Thailand, peninsular Malaysia, Pahang, Selangor, Sumatra, Borneo, Java (Duistermaat, 2012).

Ecology: Primary or disturbed evergreen, mixed or deciduous forests, often near streams.

Notes: The species most closely resembles *A. dolichandra* but differs by its longer sepals, stamens with hairy filaments, shorter anthers and capsules with basally fused valves.

Amischotolype hookeri (Hassk.) H. Hara, Flora Eastern Him. 1: 399. 1966; Duist., Gard. Bull. Singapore 64: 84. 2012; Nandikar & Gurav, J. Threat. Taxa 6: 5777. 2014. *Forrestia hookeri* Hassk., Flora 47: 629. 1864; Commelin. Ind. 89. 1870; C.B. Clarke, Commelyn. Cyrtandr. Bengal. 61. 1874, tab. XLI; Hooker f., Fl. Brit. India 6: 384. 1894; Rao *et al.*, Proc. Indian Sci. Congr. 366. 1960. **Type**: India, Khasia, *Hooker* & *Thomson s.n., s.d.* [lectotype L (designated here): L 0041654!, paralectotype B: B 100296341!]. **Fig. 1, B1-B4.**

Amischotolype hookeri was originally described as *Forrestia hookeri* by Hasskarl (1864) based on the specimens collected by J.D. Hooker and T.Thomson from Khasia Hills (montium Khasiae, inter 1-4000') and Sikkim. On a thorough search in various herbaria, only two relevant specimens were found, one each at B (B 100296341) and L (L 0041654), both collected from Khasia hills. Of these, the material at L (L 0041654) with mature capsules, laminae abaxially hairy on the veins and ciliated mouth, is selected here as the lectotype (**Fig. 4**). In the field ticket

Fig. 1. A1. *Amischotolype glabrata* Hassk.: Habit - see the terminal leaves purple on the lower surface; **A2**. Inflorescences on erect stem - see the purple sepals; **A3.** Flower - see the hairy staminal filaments and short anthers; **A4**. Capsules - see the sepal equaling the capsules and orange arils; **B1**. *Amischotolype hookeri* (Hassk.) H. Hara: Habit - see the concolorous leaves; **B2**. Inflorescences on erect stems - see the green sepals, white petals and long anthers; **B3**. Capsules - see the hairy walls, also the capsule much exceeds the sepals; **B4**. Dehisced capsules showing orange arils.

attached to these sheets, no precise locality or date of collection is indicated. Hence, the specimen at B (B 100296341) is designated here as the paralectotype.

Distribution: India (Assam, East Bengal, Meghalaya, Sikkim, West Bengal) & Bangladesh (Duistermaat, 2012).

Ecology: Along streams in deep forests.

Notes: Dark green leaves, white linear anthers and large capsules exceeding from the sepals are the distinguishing features of this species.

Amischotolype monosperma (C.B. Clarke) I.M. Turner, Novon 6: 221. 1996; Duist., Gard. Bull. Singapore 47: 516. 1997, 64: 101. 2012. *Forrestia monosperma* C.B. Clarke in Hallier f., Bull. Herb. Boissier 6: 359. 1898. **Type**: Singapore, Waterloo Estate, Perak, 1890, *Curtis s.n.* (lectotype SING!, designated by Duistermaat, 2012). **Fig. 2 & 3.**

Perennial herbs. Aerial stems arising from branched creeping rhizome, 1–1.5 m tall; internodes 5 cm long, fleshy, pubescent; hairs 0.5 mm long. Sheaths 4–5.5 × 1.8–2 cm, with dense, parallel rows of 2–5.5 mm long orange brown hairs; mouth ciliate; cilia 4 mm long. Laminae 35–46 × 10–13 cm, bullate, lower surface greenish purple, base gradually to rather abruptly narrowed into a winged pseudo petiole up to 10 cm long and 2 cm wide; upper surface pubescent; hairs 1.75 mm long, lower surface glabrous; sub marginal hairs present on the upper surface, 0.75–1 mm long; margins ciliate; hairs 0.3–0.5 mm long. Inflorescences developed on the creeping rhizome; peduncles 4–8 mm long, 22–26 flowered. Bracts triangular, purple-pink, 5.1 × 3.2 mm, keeled, margin ciliate, upper surface hairy. Flowers bisexual, sessile, 12.6 × 4.6 mm. Sepals 3, 6.4–8.5 × 2.4–2.8 mm, basally fused, thick, keeled, white with a few rose-purple streaks, hairs scattered on the upper surface and more on the keels, golden brown. Petals 3, 6.6–7.5 × 3.1–3.9 mm, free, white, glabrous, slightly serrulate at distal end when magnified. Stamens 6, all fertile, 9.3–9.5 mm; filaments white, 8.1–8.3 mm, densely moniliform hairy at distal end; anthers rose-purple, panduriform, 1.2 × 1.9 mm, longitudinally dehiscing; pollen white. Ovary white, 2.2 × 1.6 mm, golden brown hairy; style glabrous, 10.3 mm long, white; stigma papillate. Capsules obovoid, 7.8–8 × 3.4–5 mm. Seeds 2 per locule; aril orange.

Flowering & fruiting: July-September.

Ecology: Primary forest undergrowth, often in wet areas especially on stream banks. Altitude c. 250 m.

Specimen examined: INDIA: Andaman and Nicobar Islands, Campbell Bay Biosphere Reserve, East-West road, 225 m, 01.01.2010, *Santhosh Nampy* & *K.M. Manudev 3543* (CALI).

Notes: *Amischotolype monosperma* differs from other Indian species by its bullate laminae, peduncled inflorescences on creeping rhizome and purplish panduriform anthers.

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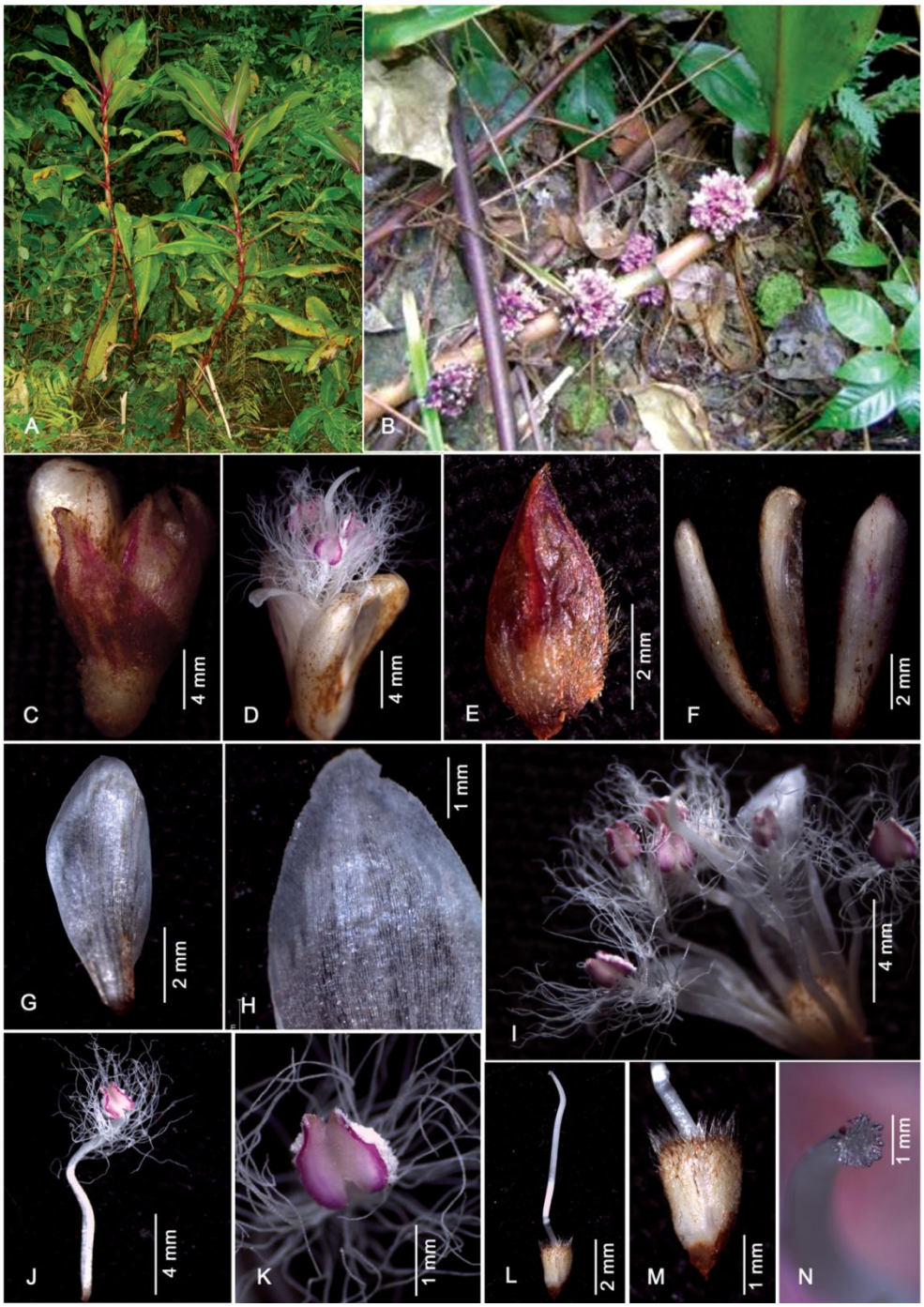

Fig. 2. *Amischotolype monosperma* (C.B. Clarke) I.M. Turner. **A**. Habit; **B**. Inflorescence on creeping stem; **C**. Bud; **D**. Flower - see the moniliform hairs on staminal filaments and purplish panduriform anthers; **E**. Bract; **F**. Sepals – see the keeled nature; **G**. Petal; **H**. Distal part of petal showing serrulated margin; **I**. Androecium; **J**. Stamen; **K**. Anther – see the white pollens; **L**. Gynoecium; **M**. Ovary – see wooly hairs; **N**. Stigma.

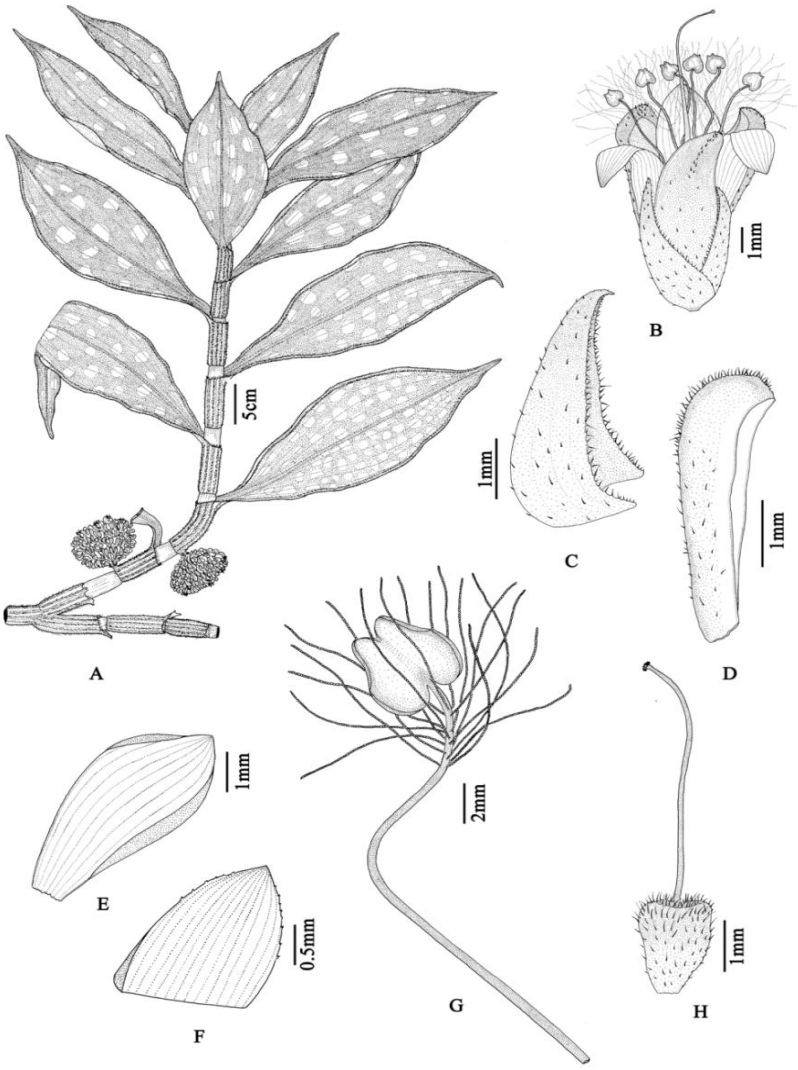

Fig. 3. *Amischotolype monosperma* (C.B. Clarke) I.M. Turner. **A**. Habit-see creeping rhizome and peduncled inflorescence; **B**. Flower; **C**. Bract; **D**. Sepal; **E**. Petal; **F**. Distal part of petal showing serrulated margin; **G**. Stamen showing moniliform hairs; **H**. Gynoecium (from *Santhosh Nampy & K. M. Manudev 3543*, drawn by Syam Radh S.).

Fig. 4. *Amischotolype hookeri* (Hassk.) H. Hara: Image of Lectotype (L 0041654).

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