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RESEARCH ARTICLE

Musa mannii var. *namdangensis* (Musaceae) from Arunachal Pradesh, India

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ABSTRACT: *Musa mannii* Baker var. *namdangensis* Gogoi & Borah a new variety of *Musa* L. sect. *Musa* is described and illustrated from Changlang district, Arunachal Pradesh, India based on observed morphological characteristics in the field. Distribution, habitat and key to the taxa are provided herewith.

KEY WORDS: *Musaceae*, *Musa*, variety, Arunachal, India.

INTRODUCTION

The genus *Musa* L. was traditionally divided in to four sections largely on the basis of the chromosome numbers: *Australimusa* (2n=20), *Callimusa* (2n=20), *Musa* (2n=22) and *Rhodochlamys* (2n=22) (Cheesman, 1947, 1949; Cheesman and Larter, 1935; Li et al., 2010; Häkkinen, 2013). Later on Argent (1976) established one more section in *Musa* L, *Ingentimusa* (2n=14), comprised of the single species *Musa ingens* N.W.Simmonds (1960), occurring in Papua New Guinea. In recent molecular study establishes that there are only two sections exist within the genus *Musa* L. (Wong et al., 2002; Li et al., 2010; Durai et al., 2011; Christelova et al., 2011). On that basis Häkkinen (2013) revised the intersectional taxonomy of *Musa* L. and merged sect. *Rhodochlamys* with sect. *Musa* and sect. *Australimusa* and sect. *Ingentimusa* in to the sect. *Callimusa*.

Musa mannii was first described by John Gilbert Baker (1892) based on a collection made by the than Conservator of Forests of Assam, famous plant collector "Gustav Mann" and placed under sect. *Rhodochlamys*. The species epithet is also based on its collector's name "*mannii*". Although the origin of *M. mannii* is in Assam of North east India, presently the species is almost extinct or critically endangered in the wild, but it is largely cultivated in the Botanical Gardens worldwide (Baker, 1892; Hooker, 1893; Häkkinen, 2002, 2007; Häkkinen and Väre, 2009). The live material which was collected by Gustav Mann was initially introduced to Herrenhausen Botanic Garden, Hanover, Germany. There form the plant was introduced to Royal Botanic Garden, Kew in the year 1885. On the basis of that material Sir J. D. Hooker updated the description of *Musa mannii* Baker with a coloured painting (*Curtis Bot. Mag*. t. 7311, 1893) which was later designated as Neotype by Häkkinen and Väre (2008, 2009). Hooker in his description wrote - "*The stem attains a height of two feet, and a girth of three and a half inches at the base, the leaf two feet in length by seven inches broad, it petiole eight inches. The spadix was six inches long. The fruit is small, three to four inches long, fusiform, obtusely trigonous, with a very broad truncate apex*." Afterwards the taxonomic identity of *M. mannii* gone towards oblivion and always confused with *M. sanguinea* as both the species originated from the same geographical area. Later on Häkkinen and Väre (2009) resolved this issue with detailed updated descriptions of both the species.

The present communication is the discovery of a new variety of *M. mannii* Baker from Arunachal Pradesh (part of earlier Assam), India. Extensive field study was carried out in different parts of Eastern Arunachal Pradesh during 2011, 2012 and May 2013 as a part of "*Flora of Anjaw district*" and "*Flora of Lohit District*, under the annual action plan project of Botanical survey of India. During the expedition in May, 2013 to Changlang district from where the here described taxon was discovered. The new variety is described based on live plants in the field by completing the entire INIBAP *Musa* Descriptor List (IPGRI-INIBAP/CIRAD 1996). The descriptive terms here follow the traditional banana taxonomy as used by Simmonds (1962, 1966). Relevant portions of the specimens were deposited as holotype at the Central National Herbarium, Botanical Survey of India (CAL) and isotypes at the herbaria of Botanical Survey of India, APRC, Itanagar (ARUN) and Botanical Survey of India, ERC, Shillong (ASSAM).

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TAXONOMIC TREATMENTS

Musa mannii var. ***namdangensis*** Gogoi & Borah ***var. nov.*** Figs. 1 & 2.

Type: INDIA, Arunachal Pradesh, Namdang, Just crossing the check gate towards Changlang, Changlang District, N 27°14'58.12" – E 95°42'21.59", 02 June, 2013, *R. Gogoi & S. Borah* 30351 (holo CAL; iso ASSAM, ARUN)

Close to *M. mannii* Baker but differs in having suckers up to 18 from the parent plant, to 155 cm tall; petiole to 80 cm long; much bigger inflorescence, initially horizontal and later pendent; basal flowers female, 1–8 in nos; fruit bunch compact, to 7 hands, fruits not fusiform, curved toward the stalk, apex not truncate; 4–8 fruits per hands, to 117 seeds per fruit.

Plant slender, suckering freely, 12–18 suckers, vertically arranged; mature pseudostem 3.5–5.5 ft. tall, 3–5 cm in diam. at base, sheaths underlaying colour yellowish green with reddish blotches, shiny, sap milky–watery. Leaf intermediate, Petiole 70–85 cm, yellowish green with reddish blotches, canal margin erect, slightly curved inward, base with reddish brown blotches, not clasping tightly. Lamina elliptic, 47–55 cm long, 33–40 cm wide, adaxially) deep green, abaxially pale to yellowish green, corrugated, apex rounded to truncate, base asymmetric, both side rounded; midrib pink abaxially, green with pink flushed adaxially. Inflorescence initially erect, later horizontal; peduncle 8–10 cm long, 2–2.5 cm in diam., pink, pubescent, not waxy; sterile bracts persistent at the opening of the female flowers. Female bud lanceolate, 22–31 cm long, 3.5–4 cm wide, bracts pink, slightly pilose outside, bracts internal side colour creamy or light pink, outside pink, convolute, lifting 2 bracts at a time, not revolute before falling; basal flowers female, to 7.8 cm long, ovary creamy, to 3.7 cm long, to 8 mm in diam., ridged, triangular to quadrangular, with ovule arranged in 2 rows per locule, style creamy, to 3.1 cm long, stigma creamy, to 7 mm across; compound tepal oblong, orange, to 4.3 cm long, to 2 cm wide at base, with 2 prominent thickened keel, apex 5 lobed; free tepal ovate, translucent white, to 3.3 cm long, to 1.8 cm wide, apex with acumen; stamens inserted, to 2.8 cm long, with pollen, filament to 1.3 cm long, creamy, anther lobe creamy, to 1.7 cm long. Male bud lanceolate, to 9 cm long, to 2 cm wide, bracts colour pink, not waxy, light pinkish internally, convolute, lifting few bracts at a time, not revolute before falling; male flowers 2–3 per bract in 1 rows, falling with bracts; compound tepal oblong, orange in colour, to 4.5 cm long, to 1.1 cm wide, with 2 thickened keel, apex 5 lobed; anthers 5, exerted, creamy, to 4.5 cm long, filament to 2 cm long, creamy, anther lobes dirty brown, to 2.5 cm long; ovary creamy, to 6 mm long, to 4 mm in diam., without additional pigmentation, style to 3.3 cm long, stigma dirty brown. Fruit bunch moderately compact, horizontal to pendent, to 7 hands, 4–8 fingers per hands in single row; fingers pointing towards the stalk, individual fruit 8–14 cm long (with pedicel), 2–2.5 cm in diam., curved, not ridged, pedicel 1–1.5 cm long, glabrous, fruit apex obtuse, immature fruit peel colour green, not waxy, fruit pulp white. Seeds angular, ca. 5 mm across, wrinkled, to 117 seed per fruit.

Distrubution: Only known from the type locality.

Habitat: This new variety grows in the hilly slops or roadsides in tropical forests.

Conservation status: Due to rapid clearing of forests and widening of roads this plant is facing serious threat of existence. Hence it can be treated as “endangered”.

Etymology: The new variety is named after its type locality i.e Namdang of Changlang district.

Note: The apparently new variety is close to *M. mannii* Baker (Hooker, 1893) and *M. rubinea* Häkkinen & C.H.Teo (Häkkinen and Teo, 2008) but different in having compact fruit bunch, more fruits in each hands, bigger size of fruits. *Musa rubinea* Häkkinen & C.H.Teo was discovered by Häkkinen and Teo (2008), where the male bud remains present till the maturity of the fruits, in *M. mannii* var. *namdangensis* the pink male bud aborted before the maturity of the fruits which makes them more closer to *M. mannii* Baker, hence authors considered it a variety of *M. mannii* Baker.

Key to *Musa mannii* var. *namdangensis* and closely related taxa

1a. Leaf habit erect, peduncle bright red, bracts blood red externally and revolute ..... ***M. sanguinea***
1b. Leaf habit intermediate, peduncle green or pink, bracts pink or crimson, not revolute 2
2a. Pseudostem with purple to reddish blotches, inflorescence erect to horizontal, male bud aborting before fruit maturity 3
2b. Pseudostem with light greenish blotches, inflorescence pendent, male bud not aborted before fruit maturity..... ***M. rubinea***
3a. Pseudostem to 155 cm, basal flowers female in female bud; lifting 4 bracts at a time in male bud, fruit bunch compact, up to 7 hands, 4–8 fruits, seeds up to 117 per fruit ……... ……. ***M. mannii* var. *namdangensis***
3b. Pseudostem to 100 cm, basal flowers hermaphrodite; lifting 1–2 bracts at a time in male bud, fruit bunch lax, with up to 3 hands, 1–3 fruits, seeds up to 30 per fruit ..... ***M. Mannii* var. *mannii***

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Fig. 1. Illustrations and photos of *Musa mannii* var. *mannii* and *M. mannii* var. *namdangensis*. A & B: *Musa mannii* Baker subsp. *mannii*. A: Neotype [reproduced from Curtis's Bot. Mag. 119: t. 7311 (1893) Drawn by Matilda Smith]. B: A live plant (photo: Markku Häkkinen). C–G: *M. mannii* var. *namdangensis* Gogoi & Borah. B: Upper portion of the pseudostem. C: Emergence of female bud. D: Close view of inflorescence. E: Fruit bunch. F: Close view of male bud. G: Close view of basal flowers in female bud.

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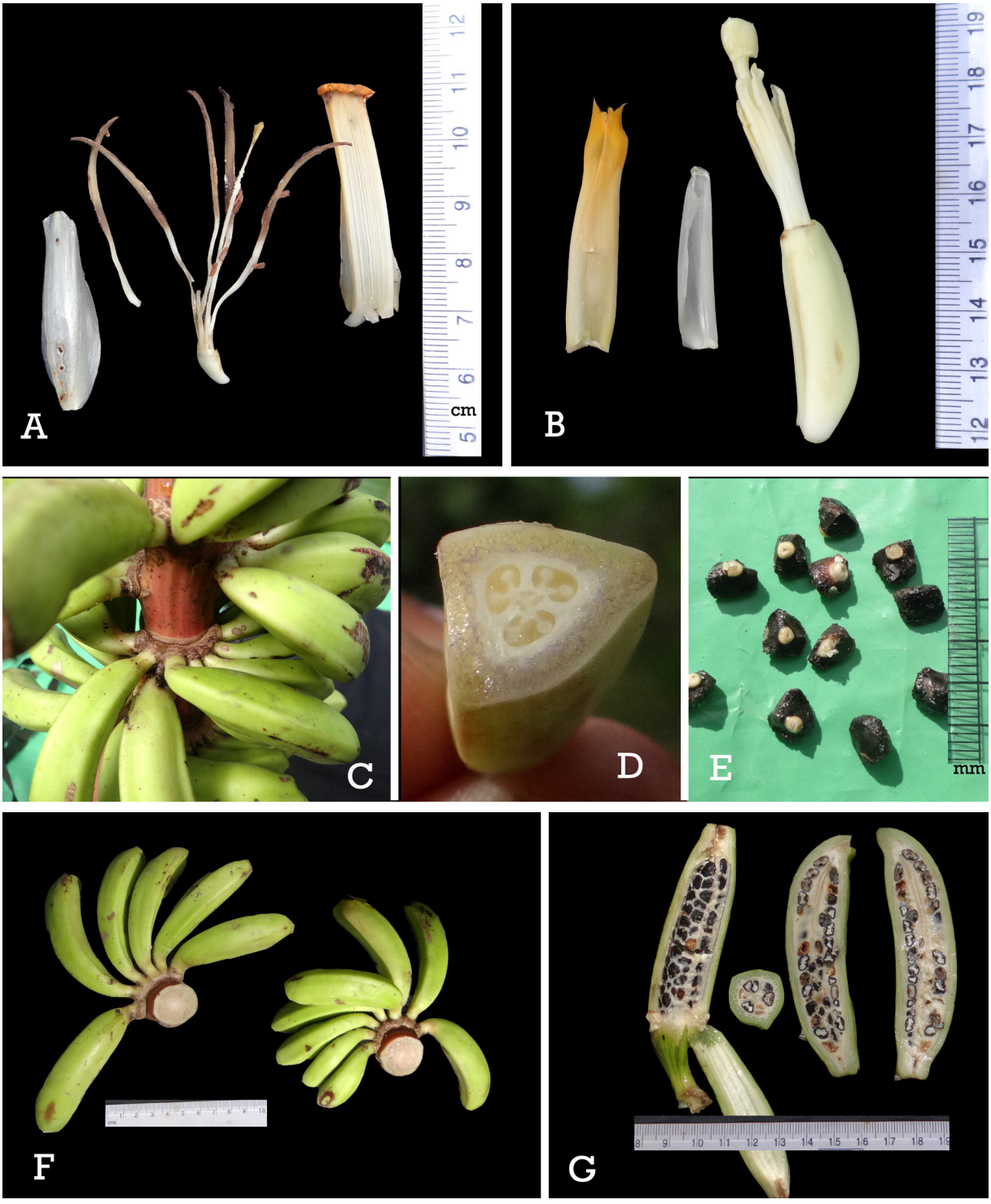


Fig. 2. Photos of *Musa mannii* var. *namdangensis* Gogoi & Borah. A: Dissected male flower. B: Dissected female flower. C: Close view of the fruit bunch rachis showing nos. of fruit in each hand. D: T.S of ovary. E: Seeds. F: Two hands of fruits. G: Cut fruits.

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