INTERNATIONAL JOURNAL OF PLANT, ANIMAL AND ENVIRONMENTAL SCIENCES
IJPAES
Volume-4, Issue-2, April-June-2014
ISSN 2231-4490

Coden : IJPAES www.ijpaes.com

Received: 10th Jan-2014 *Revised: 28th Jan-2014* *Accepted: 30th Jan-2014*

Research article

ON THE REDISCOVERY AND EXTENDED DISTRIBUTION OF *MUSA CHEESMANII MUSACEAE* FROM NORTH-EAST INDIA

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ABSTRACT: *Musa cheesmanii* is rediscovered after 57 years. A note on its extended distribution is also discussed. Detailed description and photographs are provided for easy identification.

Key words: Arunachal Pradesh, Manipur, *Musa cheesmanii*, Nagaland, Rediscovery

INTRODUCTION

Musa cheesmanii N.W.Simmonds was first described by Simmonds [11] with a detailed description. After Simmonds this taxon remained unnoticed by taxonomists for a long time. Karthikeyan *et al*. [7] and Hore *et al.* [1] enumerated it in their work based on literature. Even in some recent literature this taxon is misidentified or generalized as a common species in North-East India. Uma *et al.* [13] provided the photographs with a wrong name *M. nagensium* Prain. This has happened mainly due to the resemblance of pseudostem colour of *M. cheesmanii* and *M. nagensium*. Since no specimens were deposited in any of the herbaria after type collection this forms a rediscovery after 57 years. Simmonds described this species based on collections only from Dimapur. As no collections were made outside Nagaland later workers consider it as endemic to Nagaland. As a part of the DST Project for the taxonomic revision of Musaceae in India, authors made extensive collection throughout Northeastern states and revealed that *M. cheesmanii* is widely distributed in Arunachal Pradesh, Manipur and Nagaland. Intensive studies on this family have brought out some new taxa from India *viz. M. velutina* subsp. *markkuana* Sabu *et al.* [10], *M. velutina* var. *variegata* Joe *et al.* [3], *M. sabuana* Prasad *et al.* [8], *M. arunachalensis* Joe *et al.* [12] etc. Besides, some new additions to the wild banana flora of India were added. Sabu *et al.* [9] and Joe *et al.* [3] recorded the occurrence of *M. chunii* Häkkinen and *M. laterita* Cheesman respectively from India. Joe *et al*. [6, 4] rediscovered *M. flaviflora* N.W.Simmonds, *M. ochracea* K.Sheph. and *M. thomsonii* (King ex Schumann) A.M.Cowan & Cowan after a lapse of more than half a century.

Musa cheesmanii N.W.Simmonds, Kew Bull. 11(3): 479. 1956 ' 1957'; Karthikeyan *et al., Fl. Ind. Enum. Mon.* 104. 1989; Hore *et al*., *J. Econ. Tax. Bot*. 16(2): 451. 1992; Häkkinen & Väre, *Adansonia*, 30(1): 73. 2008. (Figure 1.)

Type:– INDIA, Assam: on the steep stony slopes by the Manipur road, 26 miles above Dimapur (Dimapur is now in Nagaland State), 2500–3500 ft., 07 May 1955, *N.W. Simmonds B.E. 90* (Holotype, K!. There are also some photographs of the specimen at K).

Plants robust, suckering freely, close to parent plant, 7–25 cm away, suckers 2–3, vertically arranged; the mature pseudostem 3.3–6.5 m high, circumference 30–51 cm at the base, dark reddish brown or reddish black, upper portion green and glaucous, pseudostem covered with old brown leaf sheaths, underlying colour greenish or reddish, shiny, highly glaucous towards apex, more prominent in young plants, sap watery, pseudostem much hard, in young and older clumps the color largely varies, much concentrated on older clumps. Leaf habit intermediate, lamina 75–185 × 50–61 cm, oblong-lanceolate, obliquely truncate at apex, adaxially green, dull, abaxially light green or with greyish tone because of high glaucous nature, highly glaucous, leaf bases asymmetric, one side rounded and other auriculate, midrib dorsally yellow green, ventrally light yellow with purple pigmentation or with purple lines. Petiole 45–55 cm long, greenish yellow to purple, petiole margins closed and overlapping with reddish black blotches at the base, petiole bases are winged and clasping the pseudostem. Inflorescence pendulous, peduncle 45–80 cm long, 3–5 cm in dia., dull green, glabrous or with some powdery appearence.

Sterile bracts two, deciduous, 48.5–63 × 4.5–11.5 cm, adaxially olive green at middle, yellow green towards apex, base and margins pink purple, sometimes apex with leaf appendage or without, slightly glaucous, abaxially base and margins red purple, green towards the apex through lines, shiny. Female bud lanceolate. Bracts lanceolate, 35–43 × 12.2–12.5 cm, smooth, adaxially dark brown purple to pink purple, yellow towards apex, slightly glaucous, abaxially red purple with yellow apex, shiny, bract apex pointed, bracts lifting one at a time, just open before falling. Basal 3–14 hands female, flowers 6–16 per bracts in two rows, 11.5–13.6 cm long, pedicellate. Compound tepal 3.1–4 × 1.1–1.6 cm, cream to creamy yellow, ribbed at dorsal angles, lobes 5, yellow, 0.6–0.8 cm long, outer two marginal lobes larger with horn-like appendage. Free tepal 2.4–3.1 × 1.7–2.3 cm, boat-shaped, translucent white or cream with yellow base, slightly corrugated at the apex with a small acumen. Staminodes 5, 1.1–1.7 cm long, cream with yellow base, apex brown. Ovary 7.7–9.7 cm long, straight, light green to yellow green, 2 ovules per locule, style straight, 3.2–3.7 cm long, cream, stigma globose, exserted, sticky, grey to brown. Male bud lanceolate, imbricate at apex, male mud developing even after maturity of fruit, rachis falling vertically, green, rachis grows after the maturity of fruits and attains 1.3–2 m long, bract scars prominent which are spatially arranged, sometimes dry bracts are persistent. Bracts 18–29.2 × 10.8–11.5 cm, lanceolate, moderately grooved, adaxially dark brown purple and yellow apex, slightly glaucous, abaxially red purple with yellow tip, apex acute, lifting 1–2 bracts at a time, just open or open and reflexed before falling. Male flowers on average 18–20 per bract in two rows, 6.5–7.2 cm long, falling with the bract. Compound tepal 4.1–4.6 × 0.8–1.1 cm, cream, ribbed at dorsal angles, lobes 5, creamy yellow, 0.3–0.4 × 0.4–0.5 cm, outer two marginal lobes larger with horn-like appendage. Free tepal 2–2.4 × 1.5– 1.7 cm, boat shaped, bilobed at apex, with a short acumen, translucent white. Stamens 5, 2.6–4.8 cm long, apex exserted, filament cream, 1.8–2.3 cm long, anther creamy yellow, 2.1–2.8 cm long, some time with an additional stamen that is very small when compared to others. Ovary straight or curved, rudiment, 1.8–2.4 cm long, cream, style cream, inserted, 4–4.6 cm long, stigma brown, globose. Fruit bunch lax, 3–14 in an inflorescence. Fruits up to 6–12 per hand, curved, elongate and angled, curved backwards and pointed towards the peduncle, in two rows, 9.8–14 cm long, 8.7–11.4 cm circumference, apex slightly pointed without any floral relicts, 0.5–1 cm long, pedicel 3–5 cm long, glabrous, pericarp dull green maturity, pulp white. Seeds large like *M. nagensium* and the genus *Ensete*, but surface warty like *M. balbisiana*, subglobose, 0.6–1 × 0.5–0.7 cm, dull black, brown when dry, 80–170 per fruit.

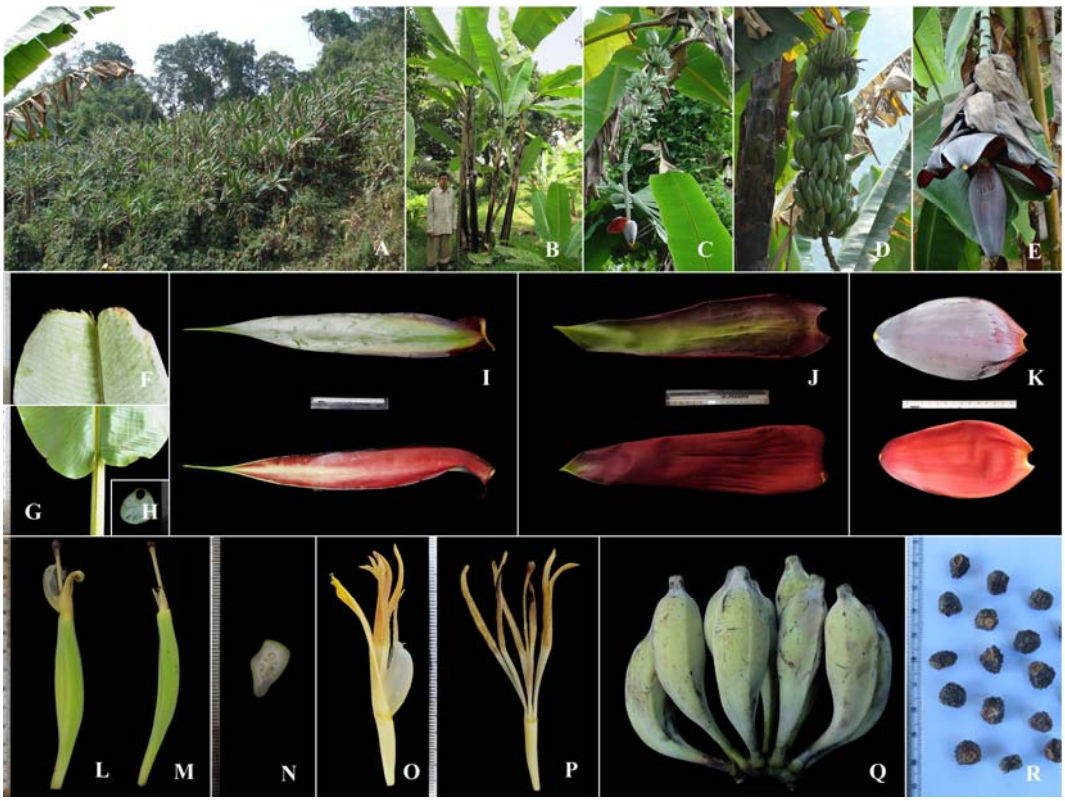

Figure 2. *Musa cheesmanii*. A. wild population, B. single clump at cultivation, C. inflorescence, D. infructescence, E. male bud with persistent bracts, F. leaf apex, G. leaf base, H. c. s. of petiole, I. sterile bract, J. female bract, K. male bract, L. female flower- entire, M. female flower without tepals, N. c. s. of ovary, O. male flower- entire, P. male flower without tepals showing six stamens, Q. fruit bunch, R. seeds. Photos by Alfred Joe.

Distribution and habitat: Endemic to India: Earlier it was considered as Endemic to Nagaland. The present study reveals the extended distribution of the taxon from Arunachal Pradesh to Manipur and it grows abundantly throughout these states (Figure 2.).

Conservation status: From the field experience for past several we place it under Least Concern (LC) category according to IUCN Red List Criteria [2].

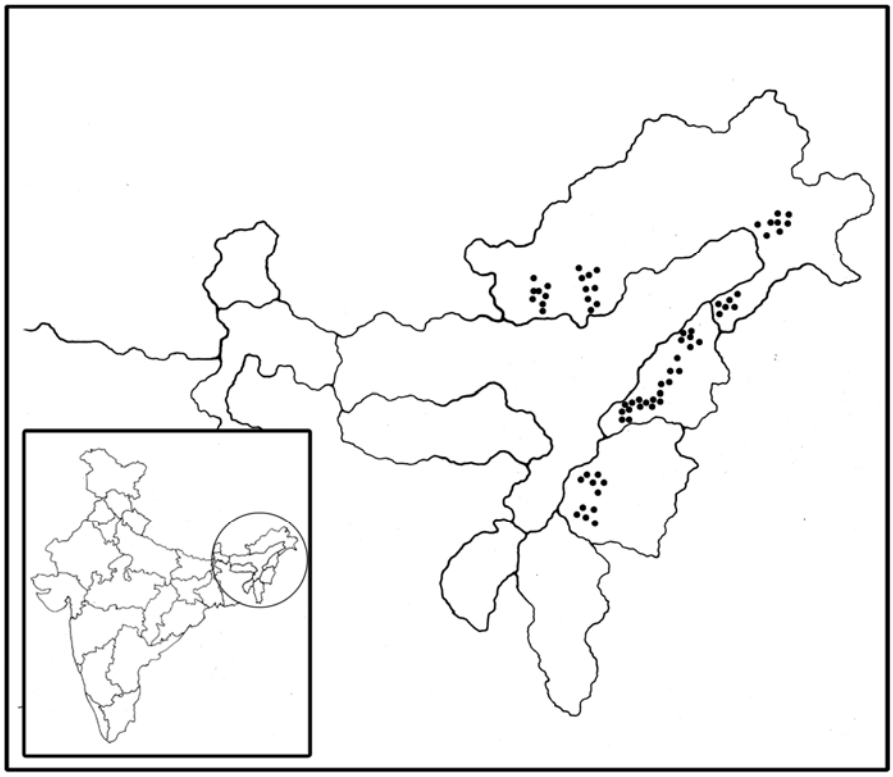

Figure 2. Map of North-East India showing major distributional localities of *Musa cheesmanii*

Flowering & Fruiting: Throughout the year.

Etymology: This species was named in honour of *Musa* taxonomist E.E. Cheesman, Imperial College of Tropical Agriculture, Trinidad, for his contribution to the wild banana taxonomy.

Specimens examined: INDIA. Arunachal Pradesh: Ittanagar, way to Banderdewa from Nirjuli, 24 December 2010, *A.Joe & Rajesh Kumar 116113* (CALI), Banderdewa, 24 December 2010, *A.Joe & Rajesh Kumar 116115* (CALI), Bomdilla, way to Bomdilla from Balukpong, Drett Elephant, 30 December 2010, *A.Joe & Rajesh Kumar 116125* (CALI), way to Bomdilla, 30 December 2010, *A.Joe & Rajesh Kumar 116128* (CALI), Tippi, near Balukpong, N27^{0}03.072' E092^{0}35.874'; 93 m, 24 March 2012, *A.Joe & Sreejith 130831* (CALI), Changlang District, Kanubari Reserve Forest, N27^{0}01.319' E095^{0}13.107'; 322 m, 10 August 2011, *A.Joe & Sreejith 130705* (CALI), Tezu, Lalpani, Hayulyang Road, N27^{0}56.282' E096^{0}22.219'; 1481 m, 06 August 2009, *Sanoj E. & Rajesh 105647* (CALI), Tippi, near Balukpong, N27^{0}03.072' E092^{0}35.874'; 93 m, 24 March 2012, *A.Joe & Sreejith 130830* (CALI) **Manipur:** Churchandpur District, Way to Samti from Churchandpur, Ciangpi, N24^{0}20.937' E093^{0}31.010'; 1007 m, 10 December 2012, *A.Joe & Ashfak 121652* (CALI), Tamenglong District, Tupul, 9 km before Noney from Imphal, N24^{0}47.538' E093^{0}39.550'; 352 m, 12 December 2012, *A.Joe & Ashfak 121668* (CALI). **Nagaland:** Manipur road, 32 miles above Dimapur, 11 May 1955, *N.W. Simmonds B.E. 96* (K!, Spirit collection & photograph).

Notes: *M. cheesmanii* shows much variation in the size of pseudostem, number of fruit bunch and fruits per hand. Inflorescence with or without female flowers are common. Those with female flowers develop up to 14 hands on a single infructescence. In some inflorescence a few male bracts are persistent. In some cases male flowers consists of six stamens. The male bud continues to grow even after the maturity of fruit and it attains about 1–2 m long or degenerate after few male bracts.

ACKNOWLEDGEMENTS

The authors are grateful to the Department of Science and Technology, New Delhi, for the financial assistance for the research projects on Indian Marantaceae and Musaceae (Sanction No. SR/SO/PS-115/09, dtd 19.08.2010). We also thank the officers of the Forest Department, Arunachal Pradesh, Manipur and Nagaland for granting permission and providing necessary help for the field studies in the forest. The authors would also like to thank to Mr. Markku Häkkinen (Finnish Museum of Natural History, Botanic Garden, University of Helsinki) for the valuable opinion on this species. Thanks are also due to Dr. Rethy (Arunachal Pradesh), Dr. S.K. Chaturvedi and Mr. Santanu Dey (Nagaland), Fr. Jose and Fr. Joy Koothur Vellattukara (Manipur) for their help during the collection of specimens.

REFERENCES

[1] Hore, D.K., Sharma, B.D., G. Pandey 1992. Status of banana in North-East India. J. Econ. Tax. Bot. 16(2): 447–445.

[2] IUCN. 2011. Guidelines for Using the IUCN Red List Catagories and Criteria Version 9.0 (September 2011). Prepared by the Standards and Petitions Subcommittee of the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

[3] Joe, A., Sabu, M., Ashfak A., Sreejith P.E. 2013. *Musa laterita* Cheesman (Musaceae): A new record for India from the wild, with a key to the *Musa* (Section *Rhodochlamys*) in India. Folia Malaysiana. 14(1): 37–44.

[4] Joe, A., Sabu, M., Sreejith P.E. 2013. On the rediscovery of Musa ochracea K.Sheph. (Musaceae) from North-East India. Taiwania. 58(4): 321–325.

[5] Joe, A., Sabu, M., Sreejith P.E. 2014. A new variety of *Musa velutina* H.Wendl. & Drude (Musaceae) from Assam, North-East India. Plant Syst. Evol. 300: 13–17.

[6] Joe, A., Sreejith, P.E., Sabu, M. 2013. Notes on the rediscovery and taxonomic status of *M. flaviflora* N.W. Simmonds and *M. thomsonii* (King ex Schumann) A.M. Cowan & Cowan (Musaceae) from India. Ann. Plant Sci. 2(8): 260–267.

[7] Karthikeyan, S., Jain, S.K., Nayar, M.P., Sanjappa, M. 1989. Musaceae. In. *Florae Indicae Enumeratio Monocotledonae.* Botanical Survey of India, Calcutta. pp. 103–105.

[8] Prasad, K., Joe, A., Bheemalingappa, M., Rao, B.R.P. 2013. *Musa sabuana* (Musaceae): A new species from Andaman and Nicobar Islands, India. Indian J. Forestry 36(1): 151–153.

[9] Sabu, M., Joe, A., Sreejith, P.E. 2013. *Musa chunii* Häkkinen (Musaceae): An addition to the wild banana flora of India and notes on conservation of a Critically Endangered species. Ann. Plant Sci. 2(5): 160–162.

[10] Sabu, M., Joe, A., Sreejith, P.E. 2013. *Musa velutina* subsp. *markkuana* (Musaceae): a new subspecies from northeastern India. Phytotaxa 92(2): 49–54.

[11] Simmonds, N.W. 1956. Botanical results of the banana collection expedition, 1954–5. Kew B. 11(3): 478–479.

[12] Sreejith, P.E., Joe, A., Sabu, M. 2013. *Musa arunachalensis*: a new species of *Musa* section *Rhodochlamys* (Musaceae) from Arunachal Pradesh, northeastern India. Phytotaxa. 134(1): 49–54.

[13] Uma, S., Sathiamoorthy, S., Durai, P. 2005. Banana. Indian Genetic Resource and Catalogue. pp 1-268. National Research Centre for Banana (NRCB), Tiruchirapalli, India.