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NOTE

On the Rediscovery of *Musa ochracea* K.Sheph. (Musaceae) from North-East India

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ABSTRACT: Since the publication of *Musa ochracea* by Shepherd in 1964, based on a specimen from an unknown locality, this taxon has not been collected from the wild. Here *Musa ochracea* is rediscovered after a lapse of about half a century from North-East India. Detailed description, illustration, photographs, distribution and ecological details are provided. IUCN conservation status based on the field study is also provided.

KEY WORDS: *Musa*, *Musa ochracea*, Musaceae, North East India, rediscovery.

INTRODUCTION

M. ochracea K.Sheph. was initially described by K. Shepherd with a good illustration in Kew Bulletin based on the plant grown from seeds collected from Poona Agricultural College, Bombay, India (Shepherd, 1964). He placed the new species in the Section *Musa* (Previously Sect. *Eumusa* (Cheesman, 1947). The description was based on the plants grown at the University of West Indies, Trinidad and Banana Board Research Department, Jamaica, which were introduced from India by Dr. R. A. Hamilton of the University of Hawaii. Shepherd had no idea about its natural distribution and he pointed that "from correspondence with Poona the species may be a native of either India or Pakistan, but such widely separated areas are suggested as Assam and the Western Ghats". Hardly any mention about *M. ochracea* has been seen in subsequent literature. Karthikeyan et al. (1989) in 'Florae Indicae Enumeratio Monocotyledonae' enumerated this species. Uma et al. (2005) and Bhakthavatsalu & Sathiamoorthy (1979) just added the name without any description or voucher specimen. Häkkinen and Väre (2008) quoted *M. ochracea* in their 'Typification and check-list of *Musa* L. names (Musaceae) with nomenclatural notes' and designated the illustration given by Shepherd as an epitype because of the bad condition of holotype and lectotype.

The epithet '*ochracea'* is based on a Latin word meaning ochreous (*ochre*-colour), i.e. the golden yellow colour or straw colour of its pseudostem. Shepherd (1964) stated that "Although undoubtedly this taxon is a member of Section *Musa (=Eumusa sensu* Cheesman (1947)), the more precise affinities of this un-expected species are hard to guess. It shares with *M. balbisiana* Colla the distinctive quadriseriate arrangement of the ovules in each loculus; in its developed petiole margins and long fruit stalks it is reminiscent of *M. itinerans* Cheesman; its bud and flower morphology are closer to those of *M. acuminata* Colla and *M. flaviflora* N.W.Simmonds; the minute seeds are only paralleled in this section of the genus by an undescribed plant from Sumatra". But this taxon is distinguishable from all other species of the sect. *Musa* by its characteristic pseudostem colour and highly wrinkled wing nature of the petiole base.

MATERIALS AND METHODS

As part of the Taxonomic revision of family Musaceae in India, we could collect live specimens of *M. ochracea* from the wild in three states of North-East India, viz. Manipur, Mizoram and Tripura. Herbarium specimens were deposited in CALI, while live germplasm was established at the Calicut University Botanical Garden (CUBG) for further studies. Photographs were taken using Sony steady shot DSC-H2 camera, photomicrographs were made with Leica M80 and line drawings were made using India ink. The species was correctly identified using all available literature.

Although this fine *Musa* was described earlier, we are updating the description of *M. ochracea,* from the wild as well as from the cultivated plant at the Calicut University Botanical Garden, by completing the International Network for the Improvement of Banana and Plantain (INIBAP) *Musa* descriptor list (IPGRI-INIBAP/CIRAD, 1996). The descriptive terms here follow the traditional banana taxonomy as used by Simmonds (1962, 1966).

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TAXONOMIC TREATMENTS

Musa ochracea K.Sheph., Kew Bull 17(3): 461–463. 1964; Karthikeyan et al., Fl. Ind. Enum. Mon. 104. 1989. (Fig. 1. & 2.)

Type: Jamaica, I. R. 578, (holotype K 25060!, lectotpye K! (preserved in liquid), epitype illustration, Kew Bull 17: 462. 1964 (designated by Häkkinen & Väre, 2008).

Plants robust, suckering freely, close to parent plant, 7–15 cm, suckers 4–5, vertically arranged; the mature pseudostem 1.9–3 m high, circumference 40–46 cm at the base, ochreous yellow, covered with old brown leaf sheaths, underlying colour greenish yellow without pigmentation, shiny, sap watery. Leaf habit intermediate, lamina 150–170 × 50–70 cm, oblong-lanceolate, truncate at apex, adaxially dark green with grey tinge, dull, abaxially dull yellow green, appearance shiny, leaf bases asymmetric, both sides rounded, midrib dorsally light green, ventrally greenish yellow. Petiole 75–85 cm long, greenish yellow, petiole margins erect with black-brown scarious margin and brown blotches at the base, petiole bases are highly winged with broad dry wrinkled scarious margin, clasping the pseudostem. Inflorescence sub-pendulous or nearly horizontal, peduncle 20–30 cm long, 4–5 cm in dia., green in colour, highly puberulent with short hairs (velvety). Sterile bracts two, deciduous, 40–60 cm long, ochraceous yellowish green, apex with leaf appendage. Female bud lanceolate, convolute. Bracts 25–36 × 13–14 cm, moderately grooved, first few bracts ochreous yellowish green with purple striations (on upper side), and cream with pink flush (on lower side), on later stages becoming dark brown purple, yet yellow towards the apex through lines: bract apex slightly obtuse and split: bracts lifting one at a time, revolute before falling. Basal 5–8 hands female, flowers 12–14 per bracts in two rows, 8.5–11.5 cm long, pedicellate, pedicel slightly puberulent, 1.5–1.7 cm long. Compound tepal 4.7–5.5 × 2.1–2.5 cm, cream, ribbed at dorsal angles, lobes 5, cream, outer two lobes larger with horn-like appendage, 0.6–0.7 × 0.5 cm. Free tepal 3.2–3.7 × 2–2.4 cm, oval, translucent creamy white, transversely corrugated at the apex with a short acumen of 0.4–0.5 cm long. Staminodes 5, 1.6–2.6 cm long, cream with black-brown apex, odd ones much larger than the even. Ovary 4.4–5.5 cm long, straight, light green–yellowish green, 4 ovules per loculus, style straight, surface rough, 3.8–4.6 cm long, cream, creamy yellow at apex and base, stigma globose, exserted, sticky, cream, 7–9 mm thick. Male bud lanceolate, top-shaped in advanced blooming, convolute, rachis falling down with a curve, green, bract scars prominent and in three rows arranged in a spiral manner. Bracts 20–29 × 8–12 cm, moderately grooved, adaxially dark brown purple and yellow towards the apex through lines, abaxially red purple with yellow tip, apex pointed, lifting one bract at a time, revolute before falling. Male flowers on average 18 per bract in two rows, 7.3–8 cm long, falling with the bract. Compound tepal 5.9–6.4 × 1.8–2.5 cm, cream, ribbed at dorsal angles, lobes 5, creamy, 0.5–0.6 × 0.4–0.5 cm. Free tepal 3.3–3.9 × 1.4–1.5 cm, translucent white, oval, transversely corrugated at apex with a short acumen. Stamens 5, 5.5–6.5 cm long, apex exserted, filament cream, 2–2.4 cm long, base of the filament and rudimentary ovary together form an S-shape curve, anther cream, 3.5–3.9 cm long. Ovary straight, rudiment, 1.1–2 cm long, cream, style cream, creamy yellow towards stigma, slightly bend at base, inserted, 5.2–5.7 cm long, stigma creamy yellow, 1–1.1 mm thick. Fruit bunch compact, 5–7 in an inflorescence. Fruits up to 12–15 per hand, in two rows, 10.5–11.5 cm long, gradually enlarged towards the tip, apex slightly pointed, 0.5–0.7 cm long, pedicel 2.5–3 cm long, slightly puberulent towards base, pericarp green and thin at full ripeness, pulp white, sweet. Seeds small when compared to other species of the genus, round-dorsiventrally flattened, 0.2–0.4 × c. 0.2 cm, dull black, brown when dry, 270–320 per fruit.

Distribution and habitat: *M. ochracea* is very common in the states of Manipur, Mizoram and Tripura of North-East India, occurring typically at elevations from 150–400 m in moist ravines along with *M. acuminata*, *M. balbisiana*, *M. cheesmanii*, and *M. ornata*. The species was also noticed along road sides and forest margins in moist soil with humus.

Conservation status: *M. ochracea* is widely distributed in Mizoram and Tripura, and may be present in some area of Bangladesh, which is adjacent to these states of India. It is also present in Manipur near Assam border. Based on the field experience for the past several years, it is kept under Least Concern (LC) category according to IUCN Red List Criteria (IUCN, 2011).

Phenology: Throughout the year.

Other specimens examined: **INDIA.** Tripura: West Tripura, Teliamura, 228 m, 21 May 2011, *A. Joe & P. E. Sreejith 116140* (CALI); Mizoram: Mamit District, 7 km from Lengpui to Mamit, 390 m, 14 March 2012, *A. Joe & P. E. Sreejith 130811* (CALI); 2 km from Lengpui to Mamit, 372 m, 14 March 2012, *A. Joe & P. E. Sreejith 130815* (CALI). Manipur: Tamenglong District, Tupul, 9 kms before Noney from Imphal, 352 m, 12 December 2012, *A. Joe & Ashfak Ahammed 121668* (CALI), Noney, 340 m, 12 December 2012, *A. Joe & Ashfak Ahammed 121670* (CALI).

Notes: *Musa ochracea* can be easily distinguished from the other members of sect. *Musa* by the ochreous yellow colour of pseudostem and highly wrinkled winged base of the petiole. It also differs from other members of the genus in India by a green pericarp and

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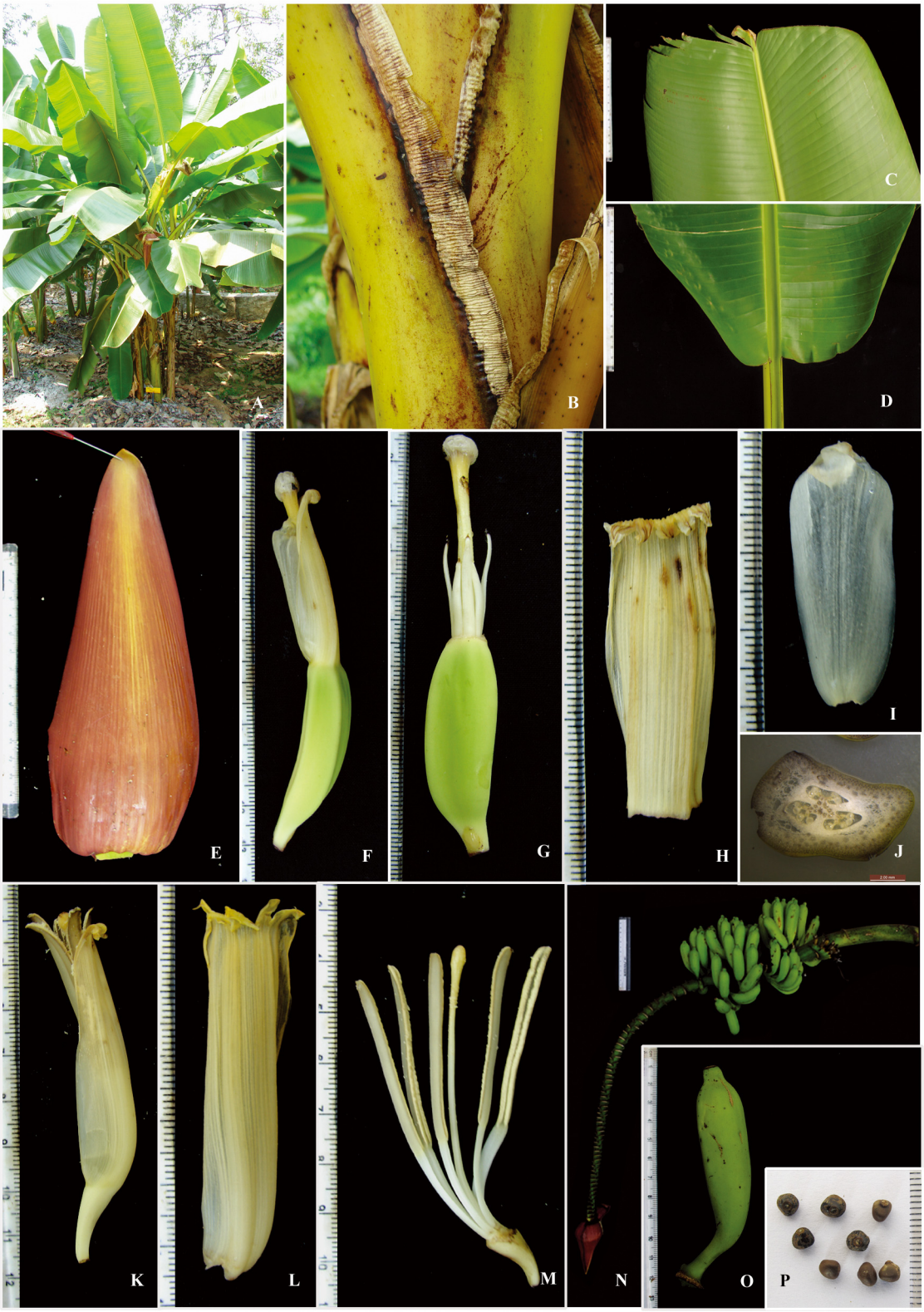


Fig. 1. *Musa ochracea* K.Sheph. A: Habit. B: Upper region of pseudostem showing wringled nature of petiole base and ochraceous colur. C: Leaf apex. D: Leaf base. E: Bract. F–J: Female flower parts. F: Entire flower. G: Flower without tepals. H: Compound tepal. I: Free tepal. J: Cross-section of ovary. K–M: Male flower parts. K: entire flower. L: Compound tepal. M: Flower without tepals. N: Infructescence. O: Mature fruit. P: Seeds. Photos by Alfred Joe.

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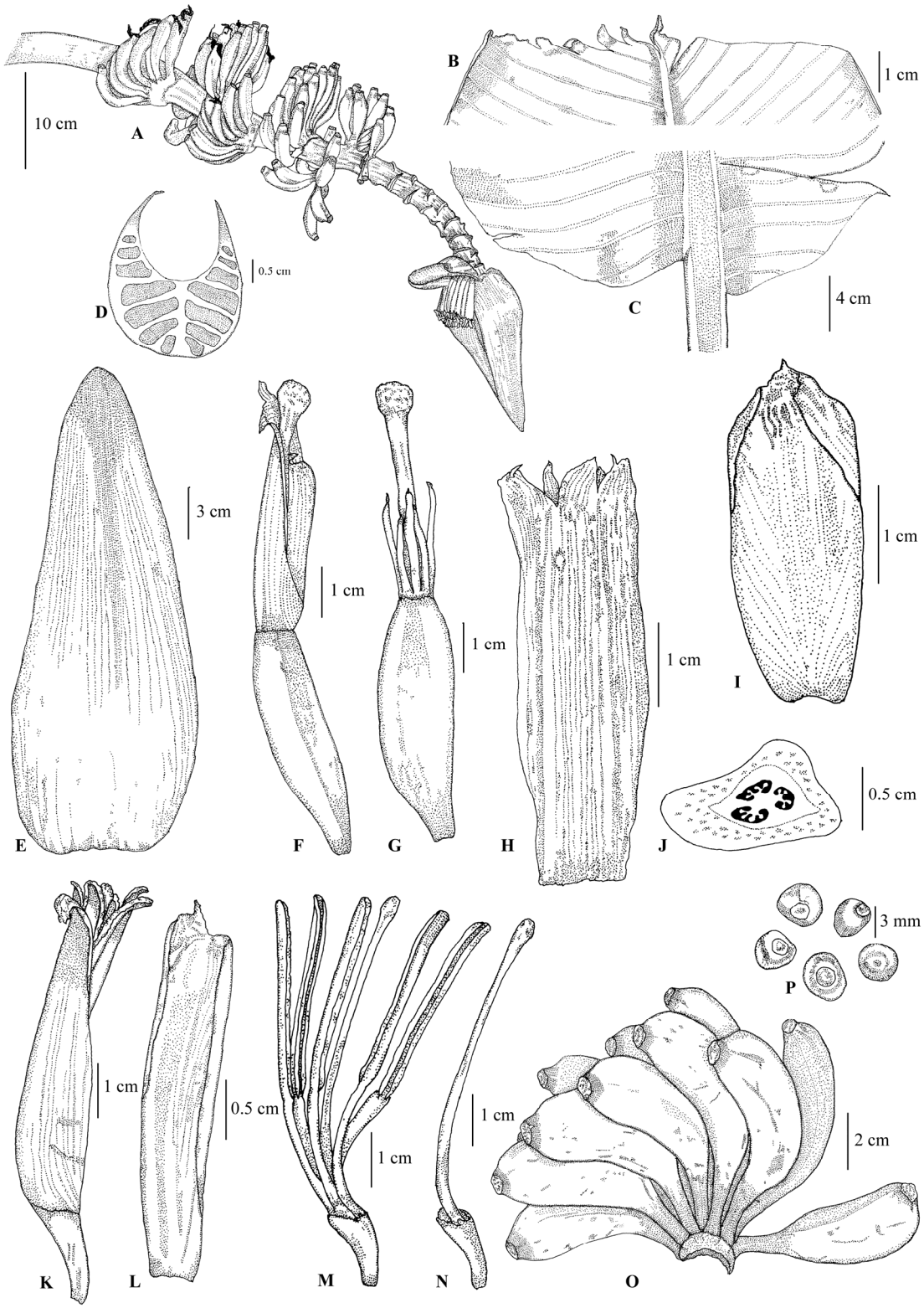


Fig. 2. ***Musa ochracea*** **K.Sheph. A: Inflorescence. B: Leaf apex. C: Leaf base. D: C. S. of petiole. E: Bract. F–J: Female flower parts. F: Entire flower. G: Flower without tepals. H: Compound tepal. I: Free tepal. J: Cross-section of ovary. K–N: Male flower parts. K: Entire flower. I: Free tepal. M: Flower without tepals. N: Rudiment pistil. O: Fruit bunch. P: Seeds. Illustration by Alfred Joe.**

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white pulp even at full ripeness, and the very small seeds. In Mizo it is known by the name 'Vumhmuam'. The Mizo people use the inflorescence for making different dishes.

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Musa ochracea 在印度西北的再發現兼首次野外採集紀錄

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摘要：自從1964年Shepherd發表原生地未知的*Musa ochracea*以來，並沒有任何關於此種的野外採集紀錄。本文報導了*Musa ochracea*在印度西北逾半世紀後的再發現，同時也是首次的野外採集紀錄；本文並提供分類描述、圖畫、照片、地理分布及詳細的生態資料，以及依野外觀察報告所擬定的IUCN保育狀態。

關鍵詞：芭蕉屬、*Musa ochracea*、芭蕉科、印度西北、再發現。

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