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Contributions to the Flora of Mount Jaya VI. A New Banana, *Musa johnsii* (Musaceae) from New Guinea

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Abstract

A new species of banana, *Musa johnsii* Argent, is described and illustrated from Papua (formerly Irian Jaya), Indonesian New Guinea, and its possible position in the genus is discussed.

Introduction

New Guinea is an important centre of diversity for the genus *Musa.* With the addition of this new species, there are ten wild species recorded most of which are endemic. The area is also arguably the richest place in the world for indigenous cultivars (Simmonds 1966), many of which are diploids and potentially important as a gene reservoir. This new banana has all the attributes of a wild species in that it has a non-parthenocarpic seedy fruit and regenerates naturally from seed distributed by animals, yet it has a sterile, non-seedy terminal portion and was cultivated in at least one village (Utekini) for its use as a vegetable.

Terminology and description follow previous tradition as used by Simmonds (1962, 1966) and Argent (1976).

Musa johnsii Argent *sp. nov.*

Species insignis propfer infructescentia densum paene sphaericum fructuum subsessilium primo ad apices truncatis demum irregulariter schizocarpicis. Ab omnibus species *Musae* differt fructu maturo cum tertia parte distali medullae sterilis composita.

Typus: Indonesia: Papua, Freeport mining concession above Timika. 1st Nov 2000 Argent *et al. 00562* (holo BO; iso K, E).

Fig 1 & 2.

Clump forming herbaceous plant. Pseudostem to 4 m tall, 28 cm diam. near the base. Predominantly brown with dead clinging pseudostems,

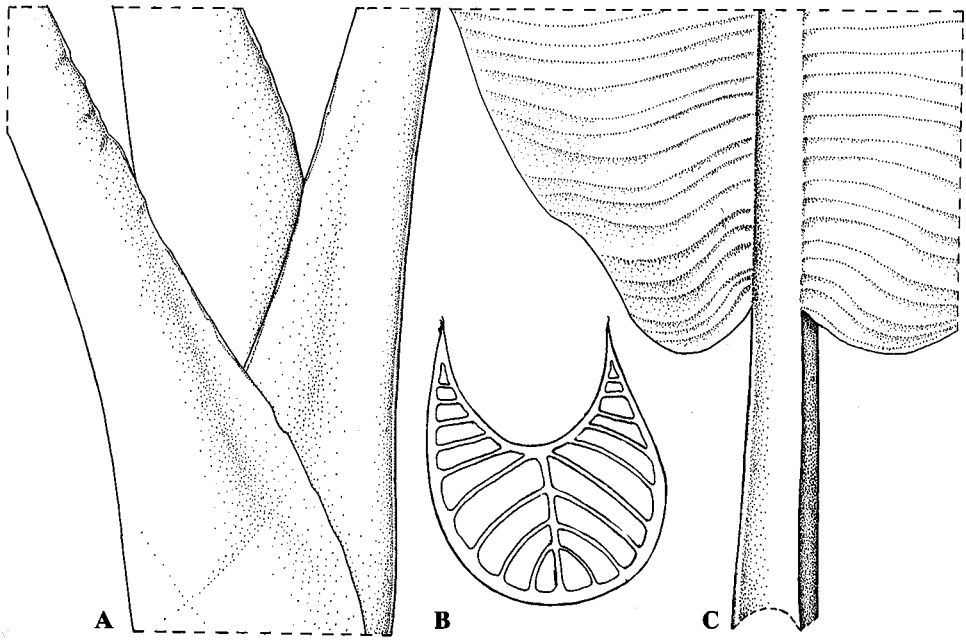

Figure 1. *Musa johnsii*, vegetative features: A. petiole bases x $^1/_4$, B. T.S. petiole x $^2/_3$, C. leaf base x $^1/_4$.

otherwise green with some dark brown coloration in the upper parts, no wax; undersheath cream to white, juice milky white or creamy. Suckering moderate, arising alongside or up to 20 cm from parent, erect or nearly so. Sucker leaves mostly auriculate. Shoulder brown or green, entire, smooth and appressed, without any scarious margin. Fourth last leaf 242 x 88 cm, right handed to c. 8 mm, (almost symmetrical), the base cordate to weakly auriculate. Other leaves often left-handed and predominantly strongly auriculate, all green, hardly different in colour above and below, slightly paler beneath and with the prominent midrib, mostly pale yellow, sometimes with a little brown proximally without obvious wax. Petiole 52 x 4.5 cm, the adaxial channel green, open with only slightly incurved or erect margins which are green, not or only narrowly (to c. 1 mm) scarious, abaxially the petiole dark chocolate brown TS ratio 0.78 (see Argent 1976). PB ratio 4—5.

Peduncle stout, green, glabrous, densely scarred. Bunch horizontal, diagonal or occasionally held completely vertically downwards. The female bracts lanceolate to 54 x 12 cm, yellow, shiny outside, dull yellow and slightly paler inside, acuminate the apical 12 cm with the margins strongly inrolled, completely and quickly deciduous. Female flowers with a few staminodes

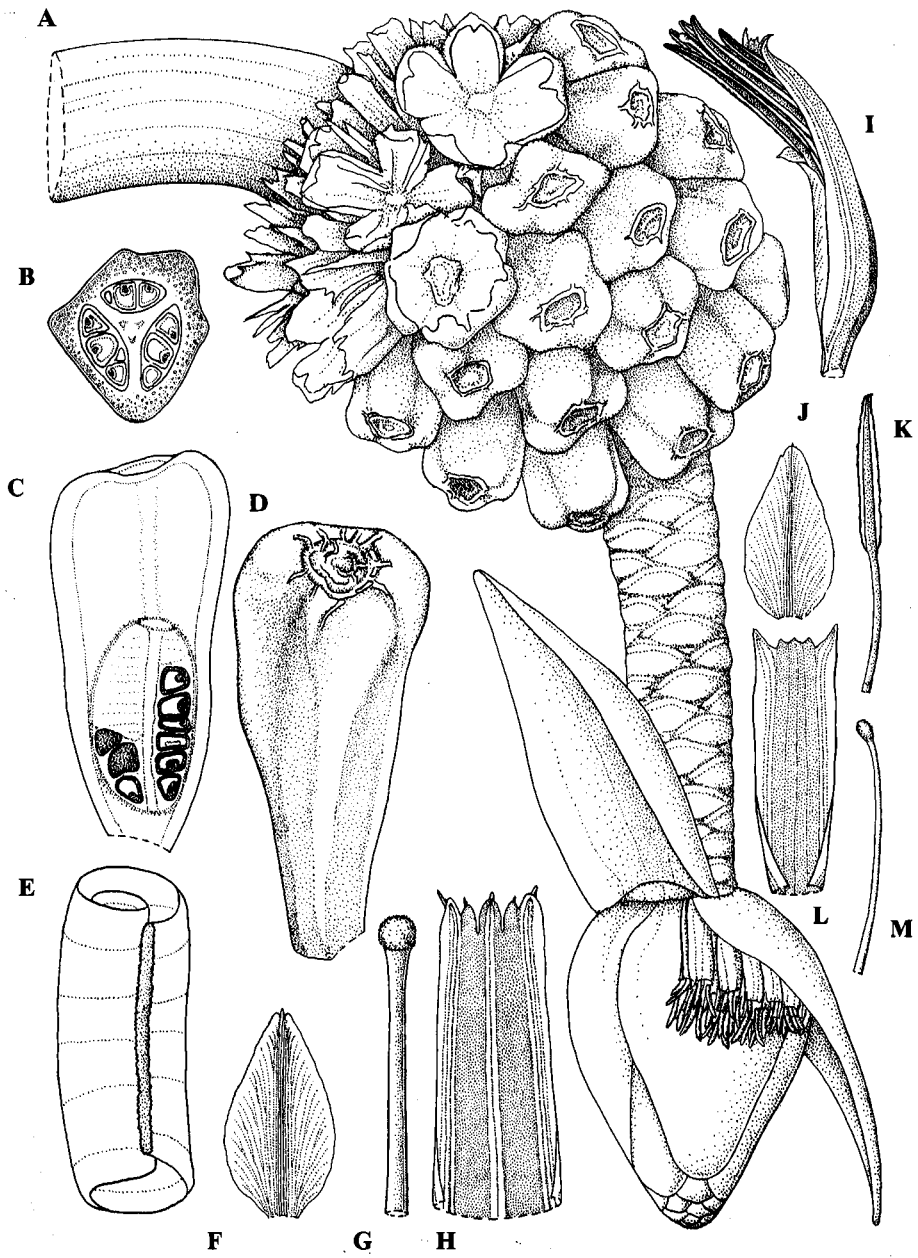

Figure 2. *Musa johnsii*, fertile features: A. habit of fruit bunch with male bud x $^1/_4$, B. T.S. fruit x $^2/_3$, C. L.S. fruit x $^2/_3$, D. whole fruit x $^2/_3$, E. female bract after dehiscence x $^1/_2$, F. free tepal of female flower x 1, G. style and stigma of female flower x 1, H. compound tepal of female flower x 1, I. male flower x 1, J. free tepal of male flower x 1, K. stamen from male flower x 1, L. compound tepal of male flower x 1, M. style and stigma from male flower x 1.

mostly less than half the length of the style, free tepal flushed purple. Ovary trilocular, each locule with the ovules in two rows.

Male peduncle growing vertically downwards. The male bud up to 14 x 11 cm, shiny yellow, imbricate for c. 2 cm from the tip. Male bracts 13 x 7 cm, shiny rich yellow outside, slightly darker near the margins, the tips pale green, shiny yellow inside although becoming dull inside after falling, with broadly rounded, obtuse apices, lifting to a high angle c. 45° to the axis; after falling only recurved at the base not revolute from the apex or margins. Male flowers, two-rowed, falling in a group, cream, the free tepal translucent white, with a rounded, erose upper margin and no wrinkle, just over half as long as the compound tepal. Compound tepal cream with pale yellow apices, the two longest points with irregular papillose to subdenticulate margins.

Fruit bunch dense, sub-spherical in shape to 17 x 18 cm. Fruit two-rowed, the second hand with 14 fruits. The fruits irregular, apparently ageotropic as they show no curvature in any part of the bunch, ripening orange but the surface becoming mostly blackish by full maturity, 8—9 x 2.5—3.5 cm, 3-, 4- or 5-angled, broadly truncate at the apex with large scars up to 2 cm diam., splitting irregularly to reveal pale pinkish orange pith and similarly coloured or yellowish flesh around the seeds in the carpel chambers, the pith white at the base of the fruit; yellow latex exuding from the cut skin of the immature fruit. Pedicel c. 2—3 mm, the fruits almost sessile. Seeds dark brown, 4—5 mm diam., irregular with rounded angles and with a distinctly domed boss opposite the hilum which is c. 2 mm in diam. and vertically striate, also with a raised band on one side from hilum to boss.

Vernacular name: Mel in the Amungkal language of the Amungme Tribe.

Uses: The Amungme people eat this species raw as a vegetable, slicing the young stalks and mixing them with local *Begonia* leaves (*nilmanep*) and salt.

Notes: Named in honour of Professor R.J. Johns who has made a lifetime study of the plants of New Guinea and who first drew my attention to this species.

This new species was a very surprising find on the southern side of the main range north of Timika. It is very distinctive in the dense subspherical bunch of almost sessile fruits, which are rather irregularly schizocarpic, and are truncate at the apex. Unlike any other *Musa* species, it has a sterile mucilaginous pith chamber in the distal third of the mature fruit.

Figure 3. Professor R.J. 'Bob' Johns with the fruit bunch and male bud of *Musa johnsii*.

Two populations were seen. The first where it was semi-cultivated for the edible leaf stalks near Utekini below Tembagapura at about 1600 m. The second was on the Darnell Ridge below the Hanekam Tunnel between 1000—1500 m altitude, where several groups of plants occurred along the roadside well away from any indigenous habitation. The largest of these populations of more than a hundred plants displayed all stages from abundant small seedlings to young clumps, plants flowering in the female phase and older ones with mature fruit and male inflorescences. They thus appear to be totally non-seasonal.

The fruits are puzzling. The distal pith chamber could be an attractive lure to the fruit but, for a wild banana, the number of seeds in the very restricted loculi is very low (an average of 46 for the 5 fruits for which seeds were counted) compared with many hundreds in most other wild *Musa* species. The flesh of this species in either the pith chamber or around the seeds in the loculi did not seem to be particularly palatable and the local people are not reported to eat the fruit at any stage. Animals were certainly visiting the ripe fruits and removing the contents and many of the seeds were damaged in the process. The fact that the female bracts are completely deciduous is remarkable in that the mature fruits are tightly packed in a very dense bunch in the sense of Argent (1976). This is no doubt achieved because of the strong revolution of the bracts from both base and apex, which results in their falling in tight rolls.

This species grows at the highest altitude of the three wild bananas encountered in the Freeport project area around Timika. *Musa banksii* F. Muell. was common in the lowland areas not too swampy and waterlogged. *M. lolodensis* Cheesman occurred mainly at the upper margin of the heath forest at about 500 m altitude, although one clump was seen growing with *Musa banksii* at less than 100 m. Both these species can be easily distinguished from *M. johnsii* even in the sterile state, as they both have broad scarious margins at the upper edge of the leaf sheath or 'shoulders' (Argent 1976). The intense green colour of the foliage and orange colour of the fruit indicate that this species probably belongs in section *Australimusa.* It would appear to be closely related to *M. lolodensis.* The seeds of the two species are remarkably similar. Apart from the vegetative difference mentioned, the fruit of these two species are very different. *M. lolodensis* has a lax bunch of distinctly long pedicellate fruit, which splits in a much more regular fashion on ripening than this new species.

There was another wild banana reported from Mt Jaya, which could be *Musa ingens* Simmonds, but this was not seen by the author. It is very distinct from this new species as it has glaucous waxy pseudostems, a reflexed 'shoulder' and a long pedicillate fruit with much larger seeds 8—9 mm in diameter.

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