

## NOTES ON WILD SPECIES OF MUSA FROM SUMATRA

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Our knowledge of the wild banana species occurring in Sumatra is still very scanty. Most herbarium collections are incomplete, and but few botanist have paid attention to them in the field.

The earlier records, field observations and collections were made by the Italian botanist Beccari about eighty years ago. He described one of his findings as *Musa sumatrana*; this species was hitherto known only from the type collection. I could study the type locality of this banana, the waterfall in the Anei canyon (called Air Mantjur in Minangkabau language), West Sumatra. It grows there together with two other wild banana species which were also found by me in other parts of West Sumatra. One of them appeared to be new to science.

The study of the wild bananas occurring in Malaysia got a new impulse by the recent breeding experiments and by the taxonomic and genetical studies that were carried out by CHEESMAN (1947, 1948, 1950) and SIMMONDS (1956, 1959) at the Imperial College of Tropical Agriculture, Trinidad. I wish to thank Mr. N. W. Simmonds for his stimulating interest in my studies of the bananas occurring in West Sumatra and for his comments on my new species. My stay in Sumatra was unfortunately too short to allow an extensive exploration of its banana flora. Besides the species described below I collected on the East Coast near Pematang Siantar a form of *Musa acuminata* Colla. (Meijer 7264), which proved to agree with the so-called Cameron form of *Musa acuminata* (= *M. truncata* Ridl.) occurring in Malaya (SIMMONDS 1955).

### *Description of species*

#### SECTION CALLIMUSA

*Musa salaccensis* Zollinger—Pisang karok  
Backer, Handboek Flora van Java 3: 133, 1924.

Stems usually about 2-2.5 m high. Leaves small as compared with *M. sumatrana* and *M. halabanensis*. Petiole circ. 75-95 cm with violet pigmentation. Blade 250-300 cm long and 45-60 cm wide; base unequal, rounded or decurrent in the petiole; apex rounded with an about 8 cm long cirrus; underside green, not waxy; main nerve (in cross section) 20 mm high and 15 mm wide; channel 8 mm deep and 10 mm wide; secondary nerves at distances of circ. 7-12 mm; marginal nerve violet. Inflorescence erect; stalk and axis violet, somewhat rough. Peduncle circ. 20-35 cm long. Female bunch with

about ten hands; each hand with 4–5 fruits in one row. Pedicel gradually thickened towards the fruit, circ. 2 cm long. Fruits pointing upwards, very light green with violet spots, with sharp angles, 8–17.5 cm long, 12–23 mm in diameter; apex blunt; at cross section about 5 seeds visible in the white pulp; seeds turbinate, at the base circ. 5 mm broad, 6 mm long near base and halfway with ringlike furrows; colour reddish brown at ripeness. Male bud with a light red-violet colour, circ. 15 cm high and 5–6 cm in diameter. Apex of bracts green; male flowers about four in the axil of each bract, light green; compound tepal light green at upper half, greenish white at base, about  $60 \times 7$  mm, with a sharp keel, at the apex with two lateral lobes of 4 mm, each with a hairlike apex of 2 mm and about three median lobes of 3 mm length; simple tepal 45–47 mm long, up to 11 mm wide. Stamens with white, towards the top widened, filaments, circ. 13 mm long, flat, up to 2 mm wide at apex; anthers faintly yellowish white,  $(26-30) \times 3$  mm, outwards curved at base. Ovary 4 mm long.

Specimens examined:

SUMATRA, West Sumatra, Ophir district, G. Talamau, 800 m, Bünнемeyer 509; Pajakumbuh region, Mt. Sago, margin of forest, 900–1000 m alt., Meijer 5788 (L). Also noted near Air Mantjur in the Anei canyon, W. Sumatra.

On Mt. Sago, W. Sumatra, this species is the most common wild banana at an altitude of about 900–1200 m. It occurs also in Java (BACKER, loc. cit.). The name “pisang karok” is also used in Malaya, though for a different species. The male bud has a bitter taste, and is not considered to be a good vegetable. The fibers are rather good for binding purposes. CHEESMAN (1950) considered *Musa violascens* Ridl. from Malaya to be a narrowly related but distinct species. The fruits of *M. violascens* are biseriate according to SIMMONDS (1955) instead of uniseriate as in *M. salaccensis*. I could confirm this during a trip in Malaya, 1960.

#### SECTION MUSA

*Musa sumatrana* Beccari ex André, Illustr. Hort. 27, 37. t. 375, 1880 —Pisang palapak.

Plants about 3–4 m high. Petioles 40–60 cm or longer (90–100); edges of fissures and underside as well as the sheath violet coloured. Blade 200–300 cm long and 50–72 cm broad; base more or less cordate with rounded lobes resembling auricles; apex blunt-rounded; cirrus deciduous; main nerve at cross section about 11 mm thick and 12 mm wide; upper side with channel of circ. 4 mm depth and 7 mm width; side nerves at distances of 6–8 mm; marginal nerve violet; underside of leaves glaucous green, waxy. Inflorescences bent down; stalk of bunch circ. 30–35 cm long, green, glabrous; axis of inflorescence green, somewhat hairy; fruiting bunch circ. 50–70 (100) cm long and 15–25 cm in diameter, usually with circ. 15–18, but in luxuriously growing plants with many more hands. Fruits circ. 15–24 per hand, biseriate, often negatively geotropic; base of

pedicels at 14–17 mm from the axis; pedicel 15–17 mm, rather abruptly passing into the fruit, which is 7–15 cm long and 1.2 cm in diameter, lightgreen, more or less terete with only one faint keel; apex rather acute, 5–7 mm long. Distance between the hands on the axis of the inflorescence circ. 5 cm; place of insertion of the hands about  $\frac{1}{2}$  of that of the axis.

Seeds embedded in white pulp, circ. 5 visible in a cross section, flat like the seeds of *Solanum melongena*, 5–7 mm in diameter, enveloped by a thin aril adhering with the central part in the form of a ring-like hilum 1.5 mm in diameter; margin sharp but irregular in outline; at centre 2 mm thick, black at ripeness. Male bud on stalk of 35–50 cm; on fruiting plants rather oblong turbinate, about three times as long as wide (8–14  $\times$  2.5–5 cm). Bracts with a dark violet-red colour, also at the inside. Flowers in two rows in the axil of the bract, seven to eight per row. Compound tepal circ. 25 mm long, translucent, except at the yellow apex, which consists of a row of three blunt lobes of 3  $\times$  2 mm and two inner ones of 2  $\times$  1 mm; simple tepal 7 mm long, 5 mm wide, apex acute, serrulate; filaments and anthers dirty white; filaments terete, circ. 13 mm long, 1 mm diam.; anthers 12 mm long, at the base not curved outwards, together 1.5 mm wide; ovary 3–4 mm long.

**Specimens examined:**

SUMATRA, West Sumatra, Air Mantjur, Anei canyon, alt. circ. 360 m, Beccari, Piante Sum. 489, August 1878 (Type, isotype herb. Kew); same locality, Meijer 7334 (herb. L, cult Hort. Bot. Leiden); Pajakumbuh region, Mt. Sago, alt. circ. 900 m, Meijer 5786, 5787, 5809 (L).

This species is narrowly related to *Musa acuminata*, especially to ssp. *microcarpa* (Becc.) Simmonds from Borneo. Future, more extensive studies will have to consider whether its status is that of a species or of a subspecies. The seeds, flat and with a sharp rim provide the best diagnostic characters. They were described in the original description as follows: "semina valde compressa margine ancipiti irregulariter dentata" (Ill. Hort. 27: 37. 1880). *Musa halabanensis* Meijer differs in its larger dimensions, the broader male bud, the lighter colour of the innerside of the bracts found in the male bud and in the shape of its seeds, which are not flat and much smaller.

***Musa halabanensis* Meijer sp. nov. — Pisang tjirik minjak.**

Planta robusta. Caulis 9 m altus. Lamina 6 m longa et 0.9 m lata. Flores feminei circ. 2.5 cm longi. Fructus teretes, 6–7.5 cm longi, apice acuminati. Semina globosum, 4 mm diam. Inflorescentia pars mascula ante anthesin conoidea; bractae extus violaceae, intus ochraceae. Flos masculus circ. 5 cm longus.

Plants large; stems up to circ. 9 m high, at the base with diameter of 20–23 cm. Leaf sheaths and base of stalk dark violet brown; the juice of all parts of these plants is turning into a brown elastic resin called "tjirik minjak" which in the Menangkabau language means dirty oil. Petiole circ. 60–100 cm long, with two sharp edges. Blade 2.3–5 m long, 60–90 cm wide; base truncate, often unequal; apex

bluntly rounded with a cirrus of 4–8 cm; underside light green coated with a thin layer of wax. Main nerve green, at the underside with a slight pigmentation, in cross section 23 mm high and 20 mm wide, with a 12 mm wide and up to 9 mm deep channel. Distances between side nerves 13–17 mm; margin of the leaf violet. Peduncle circ. 40–60 cm long, glabrous or softly hairy; young inflorescences with green inner bracts of  $70 \times 9$  cm, which when the inflorescence is detached turn light violet; outer bracts circ.  $27 \times 8$  cm, with recurved apex. Female flowers with a white translucent simple tepal, which is rather wide-boatshaped but without a large keel, 2.5 cm long, 1 cm wide from keel to margin, dented near the apex, i.e. near the apical lobe of  $1.5 \times 1.5$  mm. Compound tepal with yellow lobes, the rest dirty white, with 2 keels; lateral lobes 4 mm wide at base, 6 mm long. Stamens without well-developed anthers, sometimes with one anther only; circ. 2 cm long; style circ. 22 mm long; stigma brownish black, sticky, circ. 4 mm broad and 3.5 mm long. Bunch of fruits with about 8–9 hands; distances between the hands circ. 4–5 cm; fruits biseriate, 9–12 (in another plant 13–19) in each row; base of pedicels at 7–8 mm from axis of inflorescence, pedicel not sharply set off from the fruit, 2–3 mm wide, circ. 1–1.5 cm long. Fruit 6–7.5 cm long, at first faintly keeled, at ripeness terete, curved, negatively geotropic or ageotropic; colour light yellow-green, abruptly narrowed into the 12–13 mm long apex which is darker green than the fruit itself; the skin at ripeness splitting from apex to base into valves and showing a white pulp with glistening black, globular-pyramidal seeds (about 10 visible in a cross section of an unripe fruit), with a small white hilum of 0.5 mm diameter at point of attachment and with a flat underside, 2–3 mm high, 3–4 mm broad.

Stalk of male bud circ. 60 cm in fruiting plants; male bud ovoid, shouldered near the base, circ.  $12 \times 20$  cm in one case and  $9 \times 15$  cm in another, with dark violet bracts; inner side of bracts yellow ochre, with circ. 40 nerves; in the axil of each of these bracts two rows of 12–14 male flowers; the latter in a bud of medium age about 5 cm length; compound tepal circ. 35 mm long, at apex with ochre-yellow lobes, 2 of them pointing inwards and 3 outwards, each of them circ. 2 mm wide and 3 mm long; the two lateral lobes moreover curved sideways; the two inner curved towards the medium part of the tepal; simple tepal translucent, 17 mm long, 7 mm wide, with blunt minutely serrulate circ. 1–1.5 cm long apex.

Stamens circ. 34–35 mm long; anthers (22–24)  $\times$  2 mm, yellowish white; filaments flat, 1.5 mm wide at apex; base of anthers in some stamens at different heights, not curved inwards (as in *M. salaccensis*); ovary circ. 5 mm high.

Specimens examined:

SUMATRA, West Sumatra, Mt. Singgalang, Beccari P. Sum. 148; Anei canyon, alt. 300 m, Meijer 7533 (L); Pajakumbuh, Mt. Sago near tea garden Halaban, alt. circ. 800–900 m, Meijer 5785 (L), 5789 (type, L), 5808 (L); 7463 (L, also cult. in Hort. Bot. Leiden).

Mr N. W. Simmonds (in lit.) remarked with regard to this species

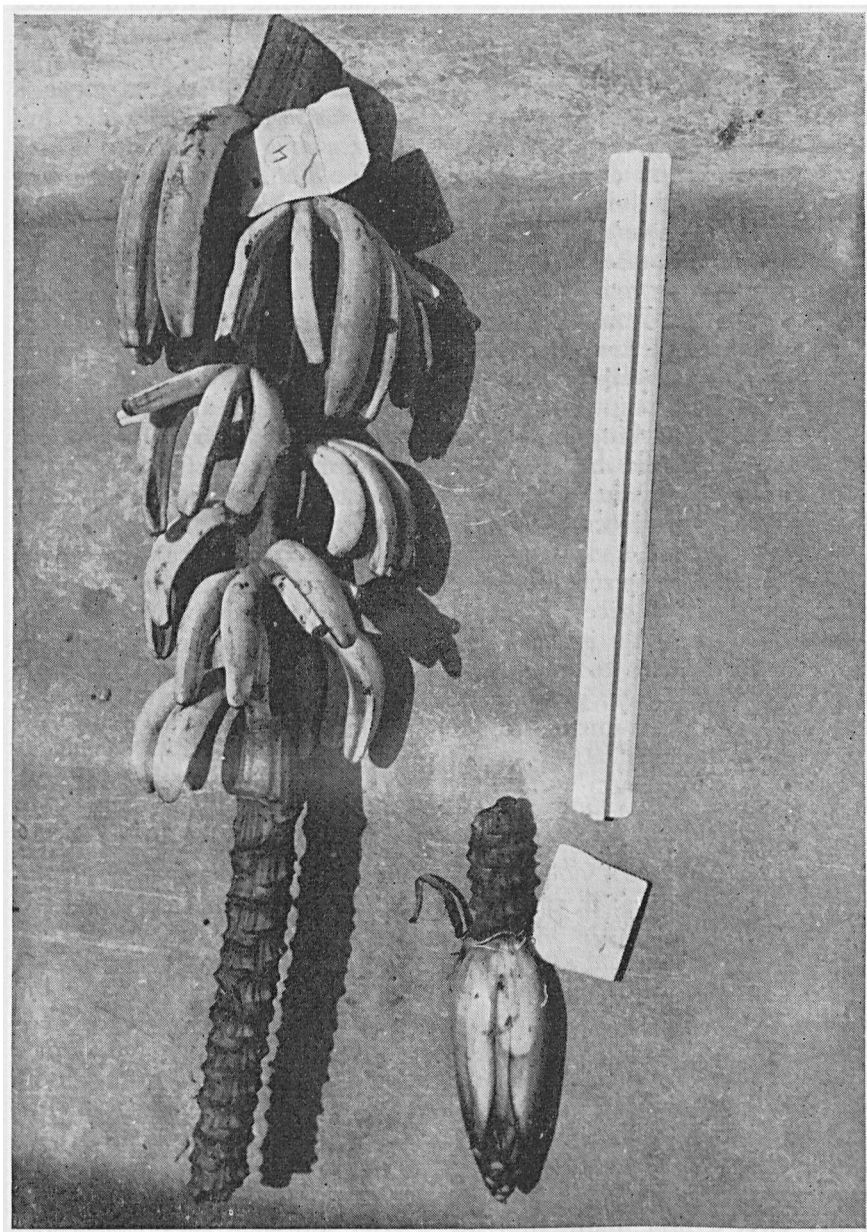


Plate 1. *Musa salaccensis* Zollinger. — Pisang karok. Male bud and fruiting bunch, coll. Meijer 5788.

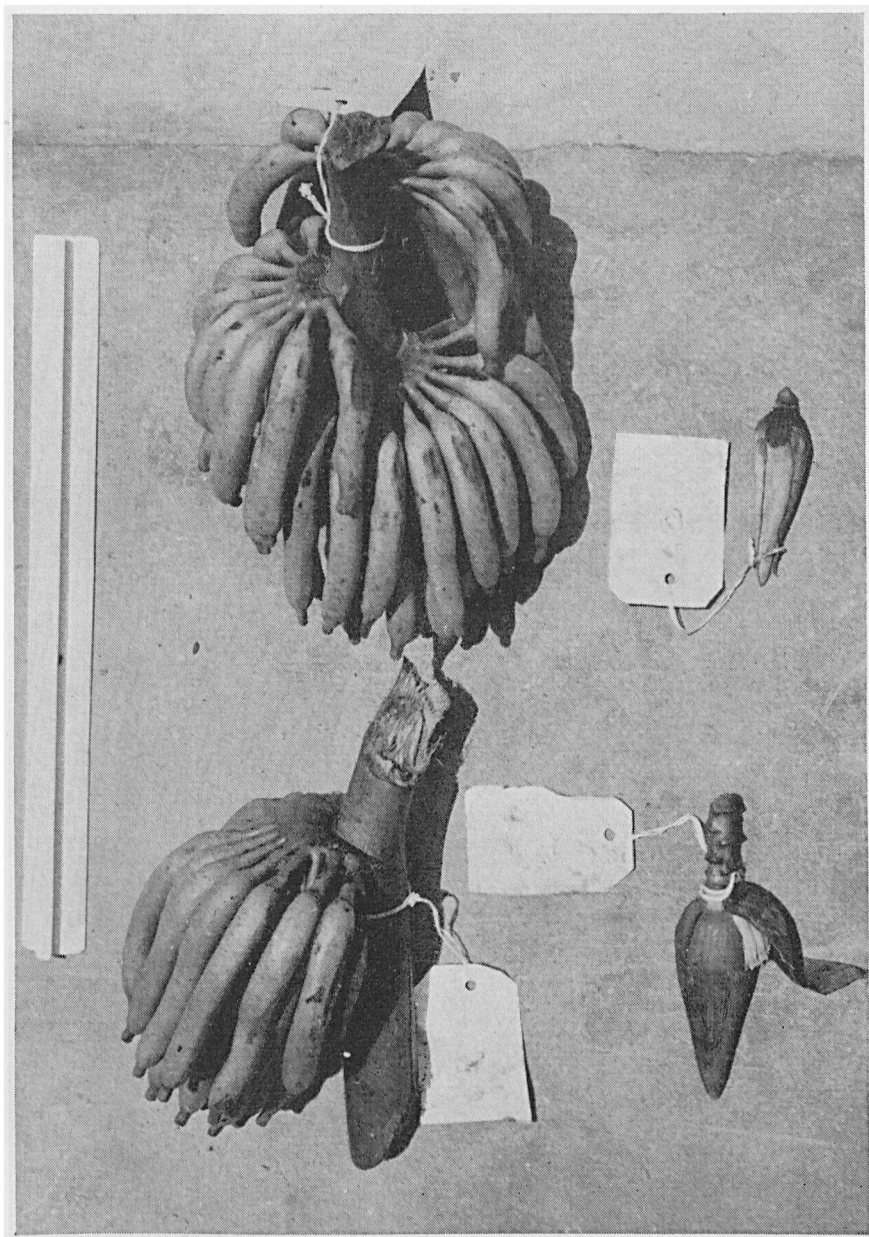


Plate 2. *Musa sumatrana* Beccari – Pisang palapak. Fruits and one male bud from Meijer 5787; male bud with bracts and flowers visible from Meijer 5786.

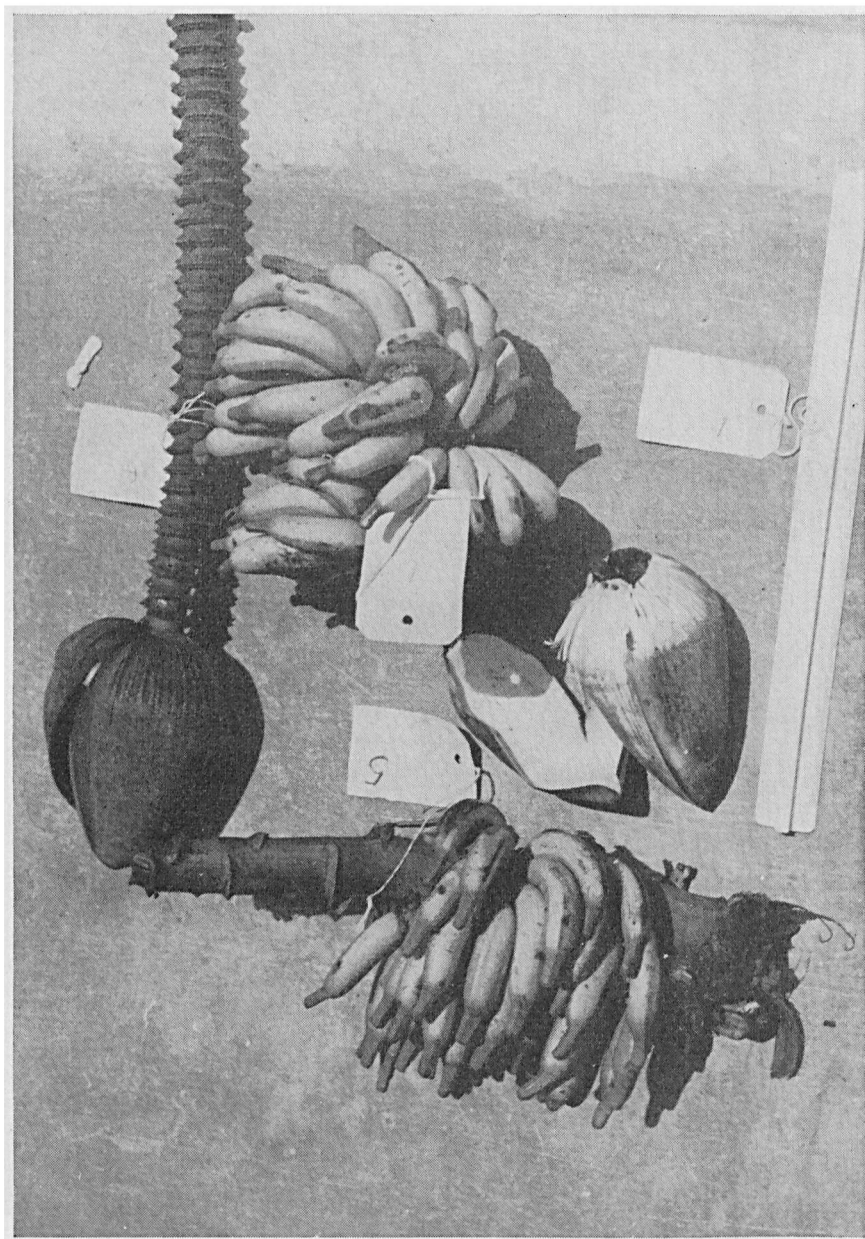


Plate 3. *Musa halabanensis* Meijer, nov. spec. Male bud with stalk and fruits on axis of inflorescence from Meijer 5789 (type); other fruits and male bud: Meijer 5785. Measure stick 30 cm.



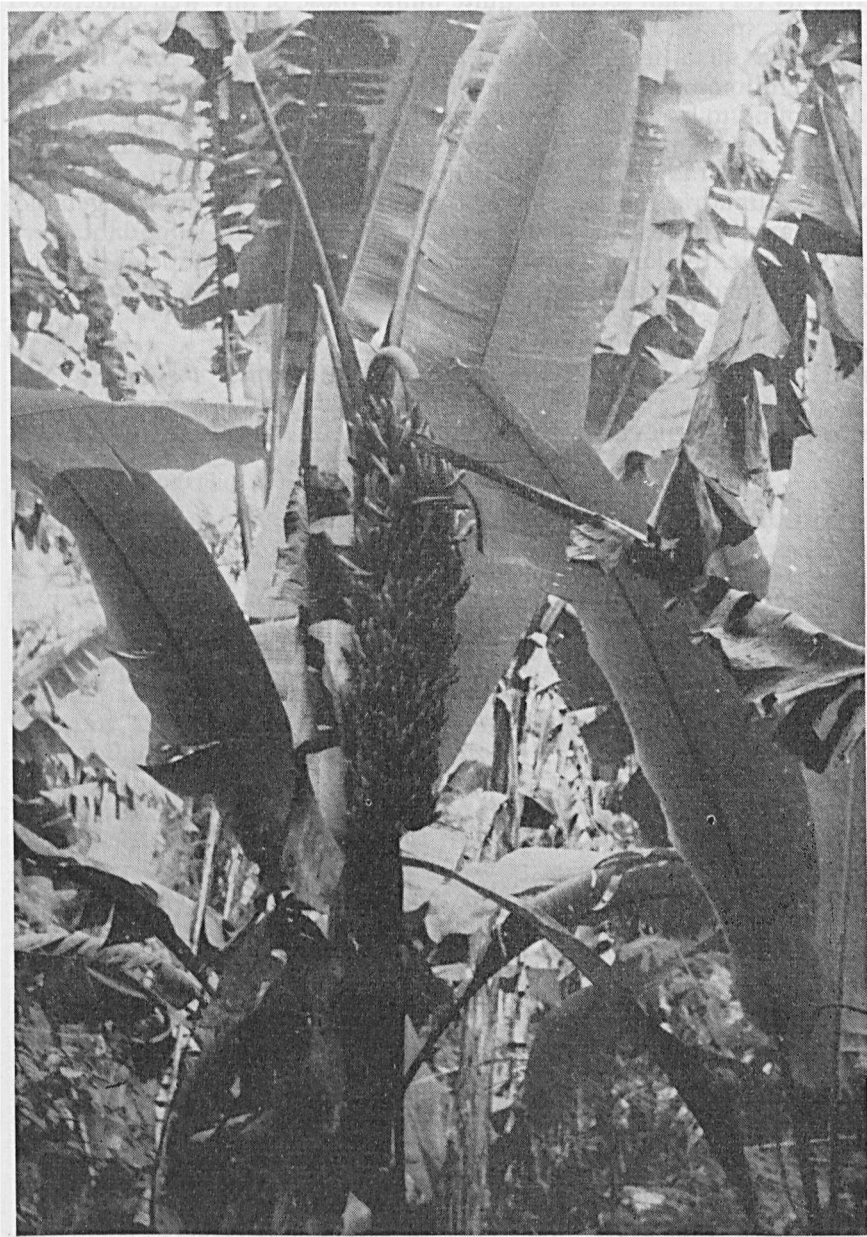


Plate 4. *Musa sumatrana* Becc. — Pisang palapak. Halaban, G. Sago, West Sumatra, 700–800 m alt.



that its very small seeds are quite unlike those of any well understood banana species. Moreover, in herb. Calcutta and herb. Bogor, he has seen seeds from Amboina, referred to *Musa sylvestris* Rumph. The chromosomes were counted at Trinidad by Mr. K. Shepherd, and found to be 22. For this reason the plant is certainly to be referred to *Musa* section *Musa* (see also SIMMONDS, 1960). According to my assistant Maradjo, who showed this wild banana to me in the forests of W. Sumatra, the male bud of *M. halabanensis* is a good vegetable. The large dimensions of all parts of the plant, the abundant, very sticky juice, the large diameter of the male bud, the shape of the fruit and the small globular seeds are a sufficient justification for regarding it as a new species.

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