SYSTEMATIC TREATMENT

_Musa L._


*Type:* _Musa paradisiaca_ L., Sp. Pl. 2: 1043. 1753 (_typ. cons._) [Current status: Hybrid (_Musa × paradisiaca_)].

Perennial rhizomatous herbs, plants suckering, clump forming or not, spreading or not spreading; rhizome running or not; suckers 2–9, vertically arranged or angled. Pseudostem cylindrical or indistinctly swollen at base, mature pseudostem stout or slender, 60–1130 cm high, 10–140 cm circumference at base, slender or stout, normally green or in different shades of green and yellow or black with or without pigmentation and with or without black or blackish brown blotches at tip; blotches may be absent or if present, it may be small and scattered to large and extensive patches; glabrous or glaucous, more glaucous towards apex region, glaucous nature prominent.
at young stages; underlying colour light green to maroon, sap watery or milky. Leaf habit erect to drooping; lamina 98–380 × 40–90 cm, oblong-lanceolate or oblong or obovate to elliptic; adaxially green or green with yellow tinge, dull; abaxially medium green or with greyish appearance, glaucous or glabrous, base symmetric or asymmetric, both sides pointed or rounded or both auriculated or one pointed and other rounded; apex truncate or acute or one side oblique and other truncate, sometimes with a tendril like appendage; midrib adaxially light green, abaxially yellowish green with or without pink or yellowish or purple or pinkish maroon tinge, glabrous or glaucous. Petioles 18–85 cm long, green or yellowish green, slightly glaucous to glabrous, petiole canal with margins overlapping to spreading; blotches present at base, brown or red-purple or black; petiole bases winged with smooth or wrinkled margins, clasping the pseudostem or not. Inflorescences erect to pendulous with or without curve; peduncle 8–80 cm long, green or with a gradient of green to yellow, with or without pigmentation/patches, glabrous or glaucous or hairy. Sterile bracts 1–4, 24–63 × 6–19 cm, lanceolate, abaxially a variable of greenish yellow to brick red, slightly glaucous or glabrous; adaxially creamy white to brick red with or without colour fadings, mostly shiny; deciduous or persistent. Female bud normally lanceolate or lanceolate at least at the emerging stage or cylindrical or intermediate or ovate-oblong; tip convolute or imbricate. Female bracts lanceolate to obovate, 14.5–53 × 4.5–16 cm, abaxially creamy white to violet purple or to dark red, glaucous or slightly glaucous, smooth or grooved; adaxially creamy white to reddish brown, shiny, with or without colour fadings; lifting 1–2 bracts at a time, reflexed and revolute or not revolute, persistent or deciduous; Basal 1–18 bunches female or bisexual. Bracts and flowers inserted independently on the axis. Female flowers 1–30 per bract in one or two rows, 6.4–13.7 cm long, colour may vary from cream to orange-red. Compound tepal 2.8–5.3 × 1.2–2.3 cm, cream to orange-red, with or without pink/purplish flush, ribbed at dorsal angles, divided only to the apex; lobes 5, outer lobes much longer than inner, marginal two lobes with small
horns. Free tepal 1.9–3.9 × 1.1–2.6 cm, translucent cream or white with or without pigmentation, boat-shaped or hood-shaped, apex corrugated or not with or without a short acumen. Stamens 1–5, 3.5–4.5 cm long, cream; filament 1.7–2 cm long, cream or white; anthers 2.1–2.4 cm long, cream or white. Staminodes present or absent, if present 2–6, 0.8–5.2 cm long, cream or creamy yellow with or without pigmentation. Ovary 2.9–10 cm long, cream to pink or red or its gradients, glabrous or hairy, straight or curved, with ovules in 2 rows or 4 rows per locule; style 2–4 cm long, cream or white with or without pigmentation, straight or curved, inserted or exserted; stigma globose, grey-brown to dull white or cream or creamy yellow, sticky. Male bud lanceolate or intermediate or top-shaped or ovoid in advanced blooming, convolute or imbricate, rachis falling vertically or erect or sub-horizontal or arched, green, glabrous with or without grooves, rachis disintegrate after production of some male flowers or continues to grow even after the ripening of fruits. Male bracts lanceolate, 9.5–30 × 5–16 cm, adaxially pink-purple or lilac or pale lilac or yellowish green or purplish or pink or brown-purple with green striations or yellow-orange combined with brick red or variables of red with red margin or deep maroon with yellow margins or dark brown purple and yellow towards apex through lines or violet-purple or crimson red or yellowish-orange or red-purple with yellow apex or green or brown-purple with yellow apex or red with green apex or red with yellow apex or red-purple with yellow striations, apex straight or curved, glabrous or glaucous, abaxially pink-purple with yellow apex or dark red with white-pink striations or pale lilac or cream with pink tinge or cream or yellow, glabrous, shiny, apex acute, lifting 1–2 bracts at a time, revolute or not revolute, bracts persistent or deciduous, bract scars prominent. Bracts and flowers inserted independently on the axis. Male flowers in 1–2 rows per bracts, 3.8–7.2 cm long, deciduous with the bracts. Compound tepal 2.7–5.7 × 0.6–1.9 cm, creamy to orange-red with or without pigmentation, apex curved backwards, ribbed at dorsal angles, divided only at the apex; lobes 5, outer and the middle lobes much longer than inner, marginal lobes with small horns. Free tepal 1.2–4 × 0.8–2.3 cm, cream
or white, translucent or opaque, with or without pigmentation, boat-shaped, corrugated or not at apex, with or without a short acumen. Stamens 5 or 5 (+ 1 much reduced staminode), 3–6.1 cm long, exserted; filaments 1.5–3.2 cm long, cream or white; anther 1.5–3 cm long, colour may be white/creamy white to pink/red, apex curved backwards. Ovary 0.7–2.4 cm long, rudiment, creamy white to red with or without pigmentation, straight or curved; style 2–4.3 cm long, glabrous, straight or curved, white or cream with or without pigmentation; stigma grayish white to orange or reddish brown, globose. Fruit bunch lax or compact, with 3–18 hands and 4–35 fruits per hand, in 1–2 rows, fruits pointed upwards on nearly horizontal or sub-horizontal or pendulous or erect axis. Fruits 5–34 cm long, straight or curved, rounded or slightly or pronouncedly ridged, pedicelled; pedicel 0.2–5 cm long, glabrous or hairy; apex pointed or lengthily pointed or blunt-tipped or bottle-necked or truncate with or without floral relicts; fruit peel varies highly – green or pink or red or maroon or silvery at maturity, greenish yellow or pale yellow or dull yellow or pink or red or maroon or orange when ripen, pulp cream or creamy white or orange. Seeds many, 30–250 per fruits, 0.2–1.4 cm, warty or smooth, round to angled, black or brown.

**Flowering & Fruiting:** Throughout the year depending up on climate, altitude and availability of water.

**Distribution:** It is tropical in distribution especially in south and southeast Asia, viz., Sri Lanka, through India, Bangladesh, south and southeast China, Myanmar, Laos, Vietnam, Cambodia, Thailand, Malaysia, Indonesia, Philippines, and New Guinea (Nayar, 2010). Maximum species diversity in peninsular Malaysia and Indonesia (Cheesman, 1947; Simmonds, 1962; Argent, 1976). In India its maximum diversity and distribution is found in the Northeastern States (Joe, 2015).

The genus is also well known for the seedless edible bananas and are widely cultivated in the tropical areas. India is famous for the diversity of
cultivated edible bananas, and banana is the second largest fruit crop cultivated in India after mango.

Ecology: Majority of wild species occur in the dense forests, often in swampy areas and open forest slopes, near riversides and also along the streams. Whereas the edible cultivated bananas were mainly cultivated in the tropics with moist organic soil.

Cytology: Mostly diploids - 2n=2x=22 (Wilson, 1946; Simmonds & Dodds, 1949; Shepherd, 1964). But in cultivated bananas diploids, triploids and tetraploids are common.

Pollination: By bats, bees, birds, ants, squirrels, etc. (Liu et al., 2002). But almost all the cultivated bananas are seedless and may be due to the absence of fertile pollen grains. Most of the cultivated bananas are triploids or allopolyploids, hence sterile.

Uses: The leaves are used as fodder and also as a wrapping material. The buds in the emerging stage and also the inner core of the pseudostem of some species are used by the tribals for making various dishes and chutneys. Some wild forms like ‘Calcutta 4’ (M. kattuvazhana) is widely used for breeding purposes. Leaves of several species are harvested for dining plates and for offerings in temples and some are often cultivated exclusively for this purpose (e.g. Musa balbisiana Colla var. elavazhai A.Joe, Sreejith & M.Sabu). Some species with bright coloured bracts are potential ornamentals.

Many banana cultivars are also used for different proposes like fruit crop, vegetable, medicine and cosmetics (Frison & Sharrock, 1999; Amnuaysin et al., 2012). Almost all parts of banana contain many nutritive compliments including minerals and fibers, and were used making many types of food items (Fingolo et al., 2012). Banana is the second largest fruit crop in India after mango and India forms one of the top banana producing countries of the world, with 15% of the total production (Nayar, 2010). Some fruits like Kunnan are widely used as a baby food especially in Kerala, and
almost all ripened fruits are also given to the children as an easily digestive and nutritional food. A number of dishes are made using different parts of banana and some are very famous also. Besides as a food crop, almost all parts of the plant are used for one or other purposes and thus it is also known as “Kalpatharu” in Malayalam.

**Variations:** According to Joe (2015) the size of the plant, number of flowers and fruits, etc. varies highly with the habitat and also with the taxa to an extent.

The genus consists of wild seeded forms and the cultivated seedless edible bananas generally referred as cultivated bananas or *Musa* cultivars. And the present study includes only the latter group – i.e., *Musa* cultivars, of South India.

According to the widely accepted theories (Kurz, 1867; Cheesman, 1947; 1948; Simmonds & Shepherd, 1955; etc.), the present day cultivated bananas were derived from the natural hybridization of two wild species – *Musa acuminata* Colla and *M. balbisiana* Colla; and they are considered as the ‘Adam’ and ‘Eve’ of present day bananas.

This chapter deals with the taxonomic treatment of these progenitors of the cultivated bananas (i.e., *Musa acuminata* & *M. balbisiana*), key to the *Musa* cultivars in South India and a detailed treatment of each cultivar.

India 157. 2015.

**Fig. 04**

**Iconotype:** Icon in Rumph., Herb. Amb. 5: t. 61, fig. 1. 1747. (Lectotype, designated by Hakkinen & Vare, 2008c).


Plants slender; suckers 2–5, vertical. Mature pseudostem 1.2–2.5 m high, 28–35 cm circumference at base, green with small blackish-brown blotches or dots or green with pink or slight purple pigmentation and covered with grayish sheaths, glaucous, more glaucous towards apex, glaucous nature prominent at young stages; underlying colour light green; sap watery. Leaf habit intermediate, laminae 120–180 × 45–52 cm, oblong but oblanceolate at young condition or seedling stage, upper surface dull, green, lower surface medium green, glabrous, apex truncate; bases asymmetric, both sides rounded; midrib dorsally light green, ventrally yellowish green with slight pinkish tinge. Petioles 35–65 cm long, green or yellowish green, slightly glaucous or highly glaucous, petiole open with margins spreading or rarely erect; blotches present at base, black; petiole bases winged, with smooth margins and clasping the pseudostem. Inflorescences horizontal; peduncle 8–46 cm long, 4–5 cm diameter, green, glabrous with or without grooves. Sterile bracts 1–2, 32–45 × 9.3–14 cm, lanceolate, abaxially brown-purple with yellowish green lines; apex leafy, slightly glaucous, adaxially pink-purple with creamy tinge, apex yellow or creamy yellow, shiny, deciduous or persistent. Female bud lanceolate, tip convolute. Female bracts lanceolate, 24–36 × 8.5–14 cm, abaxially dark red-purple or brown-purple with yellow-green lines, base red-purple, apex green, leafy or not, slightly glaucous, adaxially red-purple, apex yellow, shiny, acute; lifting 1–2 bracts at a time, reflexed and revolute before falling, sometimes persistent, basal 3–7 bunches
female. Female flowers 6–16 per bract in two rows, 8–10.3 cm long, creamy orange or orange. Compound tepal 3.6–4.9 × 1.2–1.7 cm, creamy orange, ribbed at dorsal angles, lobes 5, orange, outer lobes much longer than inner, marginal two lobes with small horns. Free tepal 1.9–2.4 × 1.8–2.6 cm, translucent cream or white, boat-shaped, apex corrugated with a short acumen, 0.4–0.5 cm long. Staminodes 5, 1.6–2 cm long, cream with slightly brown apex. Ovary 4.7–6.1 cm long, light green to yellowish green, glabrous, straight, with ovules in 2 rows per locule; style 3.2–3.5 cm long, cream, straight, inserted; stigma globose, greyish brown to dull white, sticky. Male bud lanceolate, convolute at apex, rachis falling vertically, green, glabrous. Male bracts lanceolate, 10.5–25 × 5.3–12.5 cm, abaxially red-purple or brown-purple with yellow apex, slightly glaucous; adaxially pink-purple, glabrous, shiny, apex yellow or cream with pink tinge, acute; lifting 1–2 bracts at a time, reflexed and revolute before falling, bract scars prominent. Male flowers 12–18 per bract in two rows, 4.3–6.8 cm long, falling with the bracts. Compound tepal 3.2–5.5 × 1.3–1.9 cm, creamy orange, apex curved backwards, ribbed at dorsal angles, lobes 5, orange, outer lobes much longer than inner, marginal two lobes with small horns. Free tepal 1.5–2.5 × 1.6–1.9 cm, cream or white, translucent, boat-shaped, corrugated at apex, with a short acumen. Stamens 5, 3.6–5.8 cm long, exserted; filaments 1.9–2.7 cm long, cream; anther 1.5–2.7 cm long, white or red, apex curved backwards. Ovary 1–1.5 cm long, rudiment, creamy white or dull yellow, straight; style 2–4.2 cm long, glabrous, straight, cream; stigma yellow, globose. Fruit bunch lax, with 3–7 hands and 6–16 fruits per hand, in two rows. Fruits 9–10.5 cm long, pointed upwards on nearly horizontal axis, straight or curved, slightly ridged, pedicel 1–1.5 cm long, glabrous, apex pointed without any floral relicts, fruit peel green at maturity, greenish yellow or pale yellow or dull yellow with some red to brown dots when ripe, pulp cream. Seeds 30–150 per fruit, 0.3–0.5 × 0.4–0.6 cm, warty, round to angled, black.

Flowering & Fruiting: Throughout the year.
**Distribution:** China, India (North-eastern States), Java, Malaya, Myanmar and Thailand.

**Ecology:** It is mainly seen in moist ravines under forest shades and also in grass lands.

**Notes:** All present day edible bananas were derived from this species, either pure lines or hybridization with *M. balbisiana*. Hence this species is considered as the closest and commonest wild relative of all cultivated bananas. The species exhibits high range of variation especially in the size and colour of both the vegetative and reproductive parts. The taxonomy and the variability of this species were well discussed by various authors (Cheesman, 1948; Simmonds, 1957; Joe, 2015; etc.).

**Specimens Examined:** INDIA, Meghalaya: Garo Hills, Tura peak, N25°30.447′ E090°13.792′, 500 m, 27 May 2013, A.Joe & Ashfak 121774 (CALI); Garo Hills, Tura peak, N25°30.453′ E090°13.953′, 546 m, 27 May 2013, A.Joe & Ashfak 121781 (CALI); Garo Hills, Balpakram National Park, N25°11.024′ E090°51.541′, 281 m, 29 May 2013, A.Joe & Ashfak 121786 (CALI); Jaintia Hills, Way to Dawki from Jowai (between Amlarem & Dawki), N25°15.027′ E092°05.966′, 856 m, 31 May 2011, A.Joe & Sreejith 116174 (CALI); Jaintia Hills, Sokha village, way to Dawki from Jowai, N25°12.721′ E092°02.402′, 525 m, 31 May 2011, A.Joe & Sreejith 116175 (CALI); Khasi Hills, Mahadev Village, Lower Cherapunjee, N25°12.674′ E091°44.620′, 760 m, 28 May 2011, A.Joe & Sreejith 130751 (CALI);

**Mizoram:** Darlawn Dist., Darlawn, N24°02.021′ E092°58.094′, 141 m, 17 March 2012, A.Joe & Sreejith 130823 (CALI).

Musa ‘Pisang Batu seu pisang bidji’ Rumph., Herb. Amb. 5: 132, t.60 fig. f. 1747.

Type: India orientalis, ex. Hort. Ripul. 1820, s.n. (TO image!, lectotype designated by Hakkinen & Vare, 2008c); Syntype: Icon in Rumph., Herb. Amb. 5: t. 60, fig. f. 1747. (Syntype, designated by Hakkinen & Vare, 2008c).


Musa sapientum var. pruinosa (King ex Baker.) A.M.Cowan & Cowan, Trees North Bengal 135. 1929.


Plants tall and stout, suckers 3–5, vertical. Mature pseudostem 3.8–4.5 m high, 50–60 cm circumference at the base, olive green, waxy, glaucous, more glaucous on young plants; underlying colour light green or yellowish.
green, shiny; sap watery. Leaf habit intermediate; laminae 150–240 × 60–86 cm, oblong, upper surface green, dull; lower surface medium green, glaucous; leaf bases asymmetric, both sides auriculated, truncate at apex, midrib adaxially yellowish green, abaxially pale yellow. Petioles 35–65 cm long, green or yellowish green, slightly glaucous; petiole canal margins curved inwards or overlapping or rarely open with erect margins; petiole base without prominent blotches or rarely with scattered blackish blotches, not winged and clasping the pseudostem. Inflorescence sub-horizontal/ oblique; peduncle 76–82 cm long, green to yellowish green, glabrous. Sterile bracts 1–2, lanceolate, 30–32 × 15–17 cm, abaxially ochreous yellow with pink-purple margin and base, apex green, slightly glaucous; adaxially dark red-purple with yellow apex, shiny, sometimes apex with leafy appendage, deciduous or persistent. Female bud lanceolate, tip convolute. Female bracts lanceolate, 24–29 × 14–18 cm; abaxially pink-purple with green apex, slightly glaucous; adaxially red-purple with green apex, shiny, apex truncate, lifting 1–2 bracts at a time, persistent for 2–3 days giving an appearance of bracts lifting 4–5 at a time, open and reflexed before falling, not revolute, sometimes persistent. Basal 3–10 bunches female. Female flowers 12–23 per bract in two rows, 9–11 cm long. Compound tepal 3.6–4 × 2–2.1 cm, creamy with slight pink flush and yellow base and apex or pink, ribbed at dorsal angles, divided only to the apex; lobes 5, orange-yellow, outer lobes much longer than inner, marginal two lobes with small horns. Free tepal 2.3–2.9 × 2.1–2.5 cm, boat-shaped, cream with pink tinge towards apex or fully pink or purple, apex not corrugated without a prominent acumen. Staminodes 5, 0.9–1.3 cm long, cream or dull yellow. Ovary 5.7–7.2 cm long, straight, light green to yellowish green, glabrous, with ovules in 4 rows per locule; style 2.7–3.2 cm long, straight, cream, inserted; stigma globose, grey-brown, sticky. Male bud lanceolate, convolute or sometimes slightly imbricate at apex, rachis falling vertically, green, glabrous. Male bracts lanceolate or in advanced blooming ovoid, 14.5–16 × 11–12.5 cm, abaxially pink-purple with yellow apex, slightly glaucous; adaxially blood red with greenish yellow apex, glabrous,
shiny, apex almost truncate or round, lifting 1–2 bracts at a time, open and reflexed before falling, not revolute, sometimes persistent; bract scars prominent. Male flowers 12–16 per bract in two rows, 5.3–5.5 cm long, falling with the bract. Compound tepal 4.1–4.4 × 1.1–1.2 cm, cream with pink flush, apex curved backwards, ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner, 1.1–1.2 cm long, marginal two lobes with small horn. Free tepal 2.1–2.2 × 1–1.1 cm, creamy white, translucent, boat-shaped, apex not corrugated with a short acumen or looking like trilobed apex. Stamens 5, 4.4–4.5 cm long; filaments 2.5–2.7 cm long, cream; anther 1.8–1.9 cm long, creamy yellow, curved backwards. Ovary rudiment, 1.4–1.5 cm long, straight, creamy white; style 3.4–3.5 cm long, straight or curved under stigma, cream, inserted; stigma brown, globose. Fruit bunch compact, with 3–10 hands and 12–23 fruits per hand, in two rows, fingers pointed upwards on the sub-horizontal axis, i.e. negatively geotropic. Fruits straight or curved, 8.7–11 cm long, circumference 6–12 cm, pronouncedly ridged, 4-angled; pedicel 1.8–3.7 cm long, slightly glaucous; apex slightly pointed without any floral relicts, 0.5–0.7 cm long; fruit peel green at maturity, yellow with slight powdery appearance when ripe, pulp cream. Seeds many, 187–220 per fruits, warty, black, across 0.6–0.7 cm, height 0.3–0.5 cm.

**Flowering & Fruiting:** Throughout the year.

**Distribution:** Widely distributed in South and South-East Asia. In India it is common in North-eastern States and Eastern Ghats.

**Ecology:** Unlike other *Musa* spp., *M. balbisiana* can withstand even in most dried areas and also get flowered even in the extreme drought conditions.

**Notes:** It is the commonest and most widely distributed *Musa* species in India. The diversity and distribution of this species is studied by various authors using various methods and came to the conclusion that the species is widely distributed in different parts of India, but shows remarkable variations and thus could be treated as distinct varieties within the species (Simmonds, 1962,
1966; Singh & Uma, 2000; Uma et al., 2005a, 2006; Nayar, 2010; Joe, 2015). Since the species is widely distributed and a wide range of infraspecific variation existed within the species it was highly misidentified by various workers, and the correct identity of the typical *M. balbisiana* is given by Joe (2015).


Present study identified 24 *Musa* cultivars (Bananas) from South India. All of them were collected, planted in the Calicut University Botanical Garden (CUBG) and morpho-taxonomic characterizations were made based on Descriptors of Banana (*Musa* spp.). The identified cultivars include diploids and triploids with the genomic constitution of AA, AB, AAA, AAB and ABB.

List of *Musa* cultivars in South India

1. *Musa acuminata* Colla (AA) ‘Kadali’
2. *Musa acuminata* Colla (AA) ‘Karivazhai’
3. *Musa acuminata* Colla (AA) ‘Pisang lilin’
4. *Musa acuminata* Colla (AAA) ‘Dwarf cavendish’
5. *Musa acuminata* Colla (AAA) ‘Grand naine’
6. *Musa acuminata* Colla (AAA) ‘Red’
7. *Musa acuminata* Colla (AAA) ‘Robusta’

8. *Musa × paradisiaca* L. (AB) ‘Kunnan’


10. *Musa × paradisiaca* L. (AB) ‘Neypoovan’


12. *Musa × paradisiaca* L. (AAB) ‘Namarai’


17. *Musa × paradisiaca* L. (AAB) ‘Sirumalai’

18. *Musa × paradisiaca* L. (AAB) ‘Vannan’


22. *Musa × paradisiaca* L. (ABB) ‘Kuribontha’


Key to *Musa* cultivars in South India

1. Petiole canal margin overlapping; ovules in 4 rows per locule ............ (2)

1. Petiole canal margin not overlapping; ovules in 2 rows per locule ...... (6)

2. Fruit bunch sub-horizontal or oblique; peduncle short, < 55 cm with short internodes .................................................................................. 22. *Kuribontha*

2. Fruit bunch pendulous; peduncle long, > 55 cm with long internodes ....(3)

3. Ripened fruit golden yellow with brownish blotches, circumference > 15 cm; tip rounded or blunt-tipped ........................................... 20. *Kachkol*

3. Ripened fruit greenish yellow, circumference < 15 cm; tip pointed or bottle-necked ................................................................. (4)

4. Fruit bilaterally flattened; apex pointed ....................................... 23. *Monthan*

4. Fruit rounded; apex lengthily pointed or bottle-necked ................... (5)

5. Male flower prominently purplish maroon, style straight; mature fruit not lean, ≥ 13 cm circumference ........................................ 21. *Karpuravalli*

5. Male flower prominently cream, style curved at base; mature fruit very lean < 13 cm circumference ............................................... 24. *Peyan*

6. Male bract internal surface homozygous, no sign of colour fadings towards base ............................................................................. (7)

6. Male bract internal surface heterozygous, colour fades towards base........................................................................................................ (16)

7. Petiole canal wide with erect margins .......................................... (8)

7. Petiole canal straight with curved inwards margins ....................... (11)

8. Fruit bunch horizontal ..................................................................... (9)

8. Fruit bunch sub-horizontal or oblique ............................................ (10)
9. Peduncle long, > 50 cm; male flower style curved at base, stigma dull yellow ................................................................. 17. Sirumalai

9. Peduncle short, ≤ 45 cm; male flower style straight, stigma yellow ........
.................................................................................................................. 19. Virupakshi

10. Peduncle dark green without pigmentation; anther white or creamy white with brownish violet thecae ........................................ 12. Namarai

10. Peduncle dark green with purplish maroon pigmentation; anther black or creamy white with black or rusty brown thecae ............ 14. Pachanadan

11. Mature fruit bunch pendulous ......................................................... (12)

11. Mature fruit bunch sub-horizontal or oblique .............................. (14)

12. Fruit bunch very compact; fruits cylindrical or slightly ridged, apex bottle-necked; ripened fruit with sour taste .................... 15. Poovan

12. Fruit bunch lax; fruits pronouncedly ridged, apex lengthily pointed; ripened fruit without sour taste ........................................ (13)

13. Petiole canal margins curved inwards; rachis present with persistent male bracts and flowers; fruits very long, > 19 cm; ripened fruit pulp creamy yellow ................................................................. 13. Nendran

13. Petiole canal straight with erect margins; rachis absent or if present, without male bracts or flowers or bare; fruits short, < 18 cm; ripened fruit pulp white ........................................................................ 11. Thaenkunnan

14. Leaf habit intermediate to drooping, leaf base asymmetric, one round and other pointed; fruit bunch lax ................................... 10. Neypoovan

14. Leaf habit erect, leaf base symmetric, both rounded; fruit bunch compact ........................................................................... (15)
15. Petiole canal margins curved inwards; fruits straight, perpendicular to axis, cylindrical; pedicel short, ≤ 2 cm .......................... 8. Kunnan

15. Petiole canal straight with erect margins; fruits curved back to pedicel, slightly ridged; pedicel long, > 2.2 cm................................. 9. Matti

16. Petiole canal straight or wide with erect margins .......................... (17)

16. Petiole canal open with spreading margins .................................. (18)

17. Male bud convolute; fruit bunch compact; fruits double curved or ‘S’ shaped, negatively geotropic, apex bottle-necked ............. 3. Pisang lilin

17. Male bud imbricate; fruit bunch lax; fruits straight in the distal part, slightly curved towards axis, apex blunt-tipped .................. 16. Rasthali

18. Mature fruit bunch sub-horizontal or oblique ................................. (19)

18. Mature fruit bunch pendulous .................................................. (21)

19. Petiole long, ≥ 45 cm, petiole margin gray; pedicel long, > 2 cm; fruits long, > 11 cm, apex bottle-necked .................................. 18. Vannan

19. Petiole short, < 45 cm, petiole margin purple maroon; pedicel short, < 1.5 cm; fruits short, ≤ 10 cm, apex pointed or lengthily pointed .......... (20)

20. Pseudostem whitish green with purple or rose pigmentation, male bract imbricate; fruits cylindrical ........................................... 1. Kadali

20. Pseudostem dark green with large black colouration, male bract convolute; fruits pronouncedly ridged ............................ 2. Karivazhai

21. Plants tall, > 2.5 m; mature fruit purple with or without greenish tinge, become purple in ripening, apex blunt-tipped ...................... 6. Red

21. Plants short, < 2.5 m; mature fruit dark green, become yellowish green or remains green in ripening, apex pointed or lengthily pointed .......... (22)
22. Rachis position falling vertically without curve, persistent male flowers and bracts ................................................................. 4. Dwarf cavendish

22. Rachis position falling with a curve, bare ........................................... (23)

23. Fruit dark green changes to yellow with or without slight greenish tinge at ripening; pedicel long, ≥ 2.5 cm ........................................ 5. Grand naine

23. Fruit dark green remains green at ripening; pedicel short, < 2.3 cm ...........

........................................................................................................ 7. Robusta

1. Musa acuminata Colla (AA) ‘Kadali’

**Standard Specimen:** INDIA. **Kerala:** Kozhikode Dist., Mundakkal (Cultivated), 02 September 2011, Sreejith 123214 (CALI).


**Local names:** (Kerala) Deva Kadali, Kadali; (Tamil Nadu) Ney Kadali, Neyvedykadali, Narkadali, Poovan Kadali, Vellakadali.

Plants slender, suckers 2–4, very close to parent plant, 10–20 cm away, vertical. Mature pseudostem 1.5–2.5 m high, 42–58 cm circumference at the base, whitish green with purple and rose pigmentation and covered with grayish yellow dried sheaths, with large black patches, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color yellowish white with purple patches, shiny; sap watery. Leaf habit intermediate, lamina 100–117 × 30–42 cm, oblong-lanceolate, apex rounded to obliquely truncate, with tendril-like appendage when young, upper surface dark green, shiny, lower surface dull green, waxy; leaf bases asymmetric, one round and one pointed; midrib dorsally pale green, ventrally greenish white, glaucous. Petiole 35–44 cm long, waxy, more waxy towards base, with black
large and extensive blotches, petiole canal open with spreading; margins, purplish maroon, petiole bases winged and not clasping the pseudostem. Inflorescence first horizontal and become sub-horizontal or oblique at maturity; peduncle 25–37 cm long, green with dark markings, densely hairy. Sterile bract 1, dorsally purple with yellowish green fading, sometimes with slight maroon tinge, glaucous, ventrally yellowish green with purple margins, not much grooved with green rudimentary leafy appendage at the apex, deciduous. Female bud linear-lanceolate, tip convolute or slightly imbricate. Female bracts lanceolate, 18–25 × 8–12 cm, not grooved, abaxially blackish maroon with yellowish striation, glaucous; adaxially purple with cream base, colour fades to cream towards base, shining, apex obtuse not split, lifting 1–2 bracts at a time, open reflexed and revolute. Basal 4–7 bunches female. Female flowers 5–12 per bract in two rows, 8.2–10.3 cm long. Compound tepal 3.8–4.4 × 1.8–2.1 cm, cream or creamy white with rusty black spots at the tip, slightly ribbed at dorsal angles, lobes 5, creamy yellow, outer lobes much longer than inner and the middle lobe is much broader than others. Free tepal 2.4–2.7 × 1.6–2 cm, obovate with a prominent acumen, cream, translucent, apex slightly corrugated, acumen 0.3–0.5 cm long. Staminodes 5, 2–4 cm long, white, base slightly greenish yellow. Ovary 4.5–6 cm long, yellowish green, ovules in 2 regular rows per locule; style 3.5–4 cm long, straight, exserted; stigma globose, grayish yellow, sticky. Male bud lanceolate to intermediate and become top-shaped at advanced blooming, apex slightly imbricate, sometimes aborted at fruit maturity; basal male flowers sometimes persistent, rachis horizontal, green, 20–33 cm at fruit maturity. Male bracts lanceolate to intermediate, 13.6–17.4 × 7.5–8.3 cm, not much grooved, abaxially dark purplish maroon with yellow patches, slightly glaucous; adaxially dull purple which fade to yellow towards base, fades towards base, apex intermediate to slightly obtuse, sometimes split; lifting 1–2 bracts at a time, open reflexed and revolute, deciduous; bract scars scarcely prominent. Male flowers on average 12–14 per bract in two rows, 5.5–7 cm long, sometimes persistent or deciduous. Compound tepal 4.2–4.8 × 1.7–1.9 cm,
apex lobed, curved backwards, cream, minutely ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner, 0.4–0.7 cm long. Free tepal 2.2–2.6 × 1.2–1.7 cm, white, translucent, obovate, apex smooth or slightly corrugated, with prominent, broad, truncate acumen, 0.2–0.4 cm long. Stamens 5, 3.5–4.2 cm long, filament 1.4–1.9 cm long, white; anther 1.3–1.8 cm long, cream with white thecae. Ovary rudiment, straight, 1.4–2.3 cm long, white or cream without pigmentation; style straight, exserted, 3.9–4.3 cm long, white, stigma yellow. Fruit bunch lax, with 4–7 hands and 5–12 fruits per hand, in two rows; fingers pedicelled, pedicel small, 0.5–1.2 cm long, slightly fused at base. Fruits on mid hand 6.5–9 cm long, circumference 9–13 cm, straight, circular in cross section, apex pointed, with persistent floral relicts, immature peel colour dark green, become greenish yellow on ripening, peel very thin and become papery on ripening; immature fruit pulp creamy white, becoming cream on ripening, the ripened pulp when pressed at the tip splits in to three longitudinal parts, very sweet with excellent flavour. Seeds normally absent or sometimes 1–4 per fruit, black and warty.

**Flowering & Fruiting:** Throughout the year.

**Distribution/Cultivation:** It is a small, slender and a very rare cultivar mainly found in stray cultivation in the Malabar Coast. Its cultivation is restricted to Kerala and Tamil Nadu.

**Cytology:** Diploid (AA) – 2n = 2x = 22 (Morpho-taxonomic scoring = 15 – see APPENDIX II).

**Notes:** It takes around 15–17 months to mature from planting to harvest. The fruits are largely used for offering in Hindu temples. The Sanskrit name ‘Kela’ for banana has been derived from the name *Kadali*. The fruit in ripened stage has a very sweet with excellent flavour so it is also used as an ingredient in many dishes like *payasam, prathaman*, etc. The ripened pulp when pressed at the tip splits in to three longitudinal parts. Since the bunches and fruits are very small and the plant is not largely grown, this has a great demand in
markets and may cost □ 5–8 per fruit. Agarwal (1988) also reported that the male flowers produces high quality of fertile pollen grains.

**Specimens Examined:** INDIA. Kerala: Kozhikode Dist., Chevayur (Cultivated), 07 April 2011, Sreejith 123208 (CALI); Mukkam, (Cultivated at Pantherankavu), 22 October 2014, Sreejith 123271 (CALI).

2. *Musa acuminata* Colla (AA) ‘Karivazhai’

*Standard Specimen:* INDIA. Tamil Nadu: Kolli Hills, Elangium Patty Village, Gundur Nadu (Cultivated), 01 January 2014, Sreejith & A. Kabeer 123257 (CALI).


**Local names:** (Tamil Nadu) Karivazhai, Karuvazhai, Krishna vazhai, Manoranjitham.

Plants slender; suckers 4–7, very close to parent plant, 5–14 cm away, vertical. Mature pseudostem 2.5–2.9 m high, 43–47 cm circumference at the base, dark green with large black blotches and covered with grayish black dried sheaths, with large black patches, shiny, not much glaucous; underlying color yellowish green with black coloration, shiny; sap watery. Leaf habit intermediate to drooping, lamina 204–217 × 42–46 cm, linear-lanceolate, apex obliquely truncate, with tendril like appendage when young, upper surface dark green, shiny, lower surface dull green, waxy; leaf bases asymmetric, one round and one pointed; midrib dorsally pale green, ventrally yellowish green, shiny, not glaucous. Petiole 37–41 cm long, not waxy, petiole canal open with spreading, margins green with a purplish maroon coloration; petiole bases with black large and extensive blotches, winged and
not clasping the pseudostem. Inflorescence sub-horizontal or oblique. Peduncle 50–53 cm long, 10 cm girth, green, densely hairy. Sterile bract 2, dorsally purplish maroon with yellowish green strands, not glaucous, ventrally purplish maroon with yellowish upper part, not much grooved and with green rudimentary leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip convolute and pointed. Female bracts lanceolate, 24–28 × 8.8–11 cm, not grooved, abaxially blackish or dark purplish maroon, not glaucous; adaxially purplish maroon with yellowish strands and cream base, colour fades to cream towards base, shining, apex intermediate to obtuse not split; lifting 1–2 bracts at a time, open reflexed and revolute before falling. Basal 3–5 bunches female. Female flowers 7–10 per bract in two rows, 10–10.8 cm long. Compound tepal 3.7–4.1 × 1.6–1.8 cm, cream or creamy white with rusty black spots at the tip, ribbed at dorsal angles; lobes 5, creamy yellow, outer lobes much longer than inner and the middle lobe much broader than others. Free tepal 2.7–2.9 × 2.2–2.3 cm, ovate-ovobovate, cream, translucent, apex slightly corrugated with small and pointed acumen, 0.2–0.3 cm long. Staminodes 5, 1.5–2 cm long, greenish yellow, tip white. Ovary 6.7–7.1 cm long, yellowish green, ovules in 2 regular rows per locule; style 3.2–3.4 cm long, straight, inserted, white with dark maroon dots just beneath stigma; stigma globose, grayish yellow, sticky. Male bud intermediate become obovate and top-shaped at advanced blooming, apex convolute, sometimes aborted at fruit maturity; basal male flowers deciduous; rachis falling vertically, dark green, 48–50 cm at fruit maturity. Male bracts intermediate to top-shaped, 15–17 × 9.5–11 cm, slightly grooved, abaxially dark purple, slightly glaucous; adaxially reddish maroon fade to yellow towards base, shiny, apex highly pointed, not split; generally lifting one or rarely two bracts at a time, open reflexed and revoluted before falling, deciduous; bract scars prominent. Male flowers on average 10–12 per bract in two rows, 5.5–6 cm long, deciduous. Compound tepal 4.2–4.5 × 1.5–1.7 cm, cream with yellow lobes, slightly grooved at the dorsal side; lobes 5, almost equal, 0.4–0.5 cm long, curved back, yellow. Free tepal 2.3–2.5 × 2.3–2.5 cm,
white, partially opaque, rounded or cordate, smooth with very small pointed acumen at tip, 0.2–0.4 cm long. Stamens 5, 4.3–4.6 cm long; filament 2.2–2.5 cm long, white with slight yellowish base; anther 2–2.1 cm long, cream with purplish violet thecae. Ovary rudiment, straight or slightly curved, 1.5–1.7 cm long, cream without pigmentation; style straight, exserted, 3.7–3.9 cm long, white with yellow upper part, stigma yellow. Fruit bunch lax, 3–5 hands and 7–10 fruits per hand in two rows, fingers pedicelled; pedicel very small, 0.5–1 cm long, fused at base. Fruits on mid hand 8–10 cm long, circumference 9–13 cm, straight or slightly curved, pronouncedly ridged in cross section, apex lengthily pointed, without any floral relicts, immature peel colour dark green, become yellow with slight greenish tinge at tip on ripening, peel very thick; immature fruit pulp creamy white, becoming cream on ripening, the ripened pulp when pressed at the tip splits in to three longitudinal parts, very sweet with excellent characteristic flavour and taste. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is a very rare critically endangered hill banana, endemic to Kolli Hills of Tamil Nadu (noticed only five plants grown in five separate families). It is growing under special care and respect in that area due to its ritual and sacred uses.

**Cytology:** Diploid (AA) – 2n = 2x = 22 (Morpho-taxonomic scoring = 19 – see APPENDIX II)

**Notes:** It takes around 13 to 14 months to mature from planting to harvest. This cultivar got high sacred value and the fruit is used for offering to ‘Konglaiamman’, the God of Kolli Hills of Tamil Nadu. The name Karivazhai is came from its black pseudostem (Kari in Malayalam = black) and the fruit in ripened stage has a very sweet and excellent characteristic flavour, hence got the name ‘Manoranjitham’. The fruits are very small and easily fall off from the bunch. The fruit has great demand and generally rate more than ten rupees per fruit.
Conservation aspects: Some conservation aspects and propagation techniques were started in the native places itself. The agricultural bodies started some macro-propagation techniques but it is not successful to this cultivar. The plant conserved in the Calicut University Botanical Garden and is also growing well.

3. **Musa acuminata** Colla (AA) ‘Pisang lilin’

**Standard Specimen:** INDIA. Kerala: Malappuram Dist., Calicut University Campus (Cultivated), 21 December 2010, Sreejith & A. Joe 123201 (CALI).

**Local names:** (Kerala) Kavery, Mankompu, Mezhukuthiri pazham, Mezhukuthiri vazha, Dayana, Sugandhi, Sundari kadali, Sundari poovan; (Tamil Nadu) Kavery. (Malaysia) Pisang Lilin, Lidi, Pisang Lidi, Pisang Empat Pulu Hari, Pisang Lemak Manis Terenganu, Pisang Lemak Manis Kelantan, Pisang Mas Sagura; (Indonesia) Pisang Lilin, Pisang Muli; (Philippines) Mama-on; (Thailand) Kluai Lep Mu Nang, Kluai Thong Ki Maew, Kluai Thong Kap Dam; (Vietnam) Chuoi Tien.

Plants slender, suckers 2–5, very close to parent plant, 2–15 cm away, vertical. Mature pseudostem 1.4–2.8 m high, 28–33 cm circumference at base, light green with blackish brown pigmentation and covered with grayish yellow dried sheaths, with large black patches, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color light green with very light pinkish pigmentation, shiny; sap watery. Leaf habit erect, lamina 120–173 × 45–56 cm, oblong, apex truncate, with tendril like appendage when young, upper surface dark green, shiny; lower surface dull green, waxy; leaf bases asymmetric, one round and one pointed, midrib dorsally pale green with slight pinkish pigmentation, ventrally greenish white, glaucous. Petiole 58–68 cm long, waxy, more waxy towards base; petiole canal straight with erect, margins purplish maroon, petiole bases with black large and extensive blotches, winged and not clasping pseudostem. Inflorescence first horizontal and become sub-horizontal or oblique; peduncle
27–42 cm long, green with dark markings, slightly pubescent. Sterile bract 1, dorsally greenish yellow with purple fadings, sometimes with slight maroon tinge, glaucous; ventrally purple with yellowish green base and margins, not much grooved, green rudimentary leafy appendage at the apex, deciduous. Female bud linear-lanceolate, tip convolute. Female bracts lanceolate, 22–31 × 11–12.5 cm, smooth and not grooved, abaxially purplish maroon with or without yellowish striation, slightly glaucous; adaxially purplish maroon fades to cream towards base and margins, shining, apex slightly pointed to intermediate, not split, usually lifting one bract at a time, open reflexed and revolute. Basal 4–8 bunches female. Female flowers 11–18 per bract in two rows, 8.5–11.5 cm long. Compound tepal 4–4.6 × 1.5–2.1 cm, cream or creamy white, slightly ribbed at dorsal angles, lobes 5, yellow, outer and central lobes much longer than others and central lobe much broader than others, outer lobes with beak-like projection. Free tepal 2–2.6 × 1.4–2.1 cm, ovate to obovate with prominent acumen, cream or creamy white, translucent, apex slightly corrugated, acumen pointed, 0.2–0.5 cm long. Staminodes 5, unequal, 1.4–2.9 cm long, creamy white or white with cream base. Ovary 6.2–7.5 cm long, yellowish green without pigmentation, curved or twisted, ovules in 2 regular rows per locule; style 2.7–3.8 cm long, straight, exserted, white with pinkish pigmentation and cream or grayish yellow stigma, stigma globose, sticky. Male bud slightly lanceolate to intermediate and become top-shaped at advanced blooming, apex convolute; rachis horizontal, green, 35–51 cm at fruit maturity. Male bracts lanceolate to intermediate, 16–19 × 8.5–10 cm, minutely grooved; abaxially dark purplish red to pinkish maroon without pigmentation, slightly glaucous; adaxially reddish maroon which fade to cream towards base, shiny, apex intermediate to obtuse, not split; lifting 1–2 bracts at a time, open reflexed and revolute, deciduous; bract scars scarcely prominent. Male flowers on average 14–20 per bract in two rows, 6–6.6 cm long, deciduous. Compound tepal 4.4–5 × 1.3–1.4 cm, apex lobed, curved backwards, cream or creamy white, minutely ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner, 0.4–0.7 cm long. Free tepal 2–2.2
× 1–1.2 cm, white, translucent, obovate, apex smooth or slightly corrugated with a prominent acumen, narrow, 0.2–0.3 cm long. Stamens 5, 4–4.4 cm long; filament 1.6–1.8 cm long, white with cream base; anther 2.3–2.5 cm long, cream with whitish gray thecae. Ovary rudiment, straight, 1.4–1.6 cm long, creamy white without pigmentation; style straight, inserted, 4.1–4.4 cm long, white with yellow stigma. Fruit bunch compact, with 4–8 hands and 11–18 fruits per hand, in two rows; fingers pedicelled, pedicel 0.8–2 cm long, no sign of fusion of pedicel. Fruits on mid hand 13–19 cm long, circumference 8–12 cm; curved and ‘S’-shaped, circular or slightly ridged in cross section, apex bottle-necked, without any floral relicts, immature peel colour dark green, become bright yellow on ripening, without any markings, peel up to 4 mm thick; immature fruit pulp white, becoming cream on ripening, sweet with a little sour taste and a characteristic flavour. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is a Malaysian cultivar widely cultivated in Malaysia, Indonesia, Philippines, Thailand and Vietnam, and is introduced to Karnataka then to Kerala and Tamil Nadu. It is a small, slender and a rare cultivar found in stray cultivation in the Malabar area and also in and around Thiruvananthapuram district of Kerala, where it is commonly called as *Kavery, Sundari kadali, Sundari poovan* and *Sugandhi*.

**Cytology:** Diploid (AA) – 2n = 2x = 22 (Morpho-taxonomic scoring = 23 – see APPENDIX II)

**Notes:** It takes around 6–10 months to mature from planting to harvest and needs less manure compared to other native cultivars. Due to its specific characteristics of its fruit, it got different names such as ‘Sugandhi’ (flavour), ‘Mezhukuthiri pazham’ (lean and slender nature), ‘Mankompu’ (curved and twisted fruit - like the horn of Deer), *Sundari poovan* and *Sundari kadali* (beautiful plant and fruit). According to the farmers view, its cultivation is highly economic and due to its short size and lifecycle, it needs less care and
can produces up to 7 bunches within two years from the same clump. It is also good for diabetic patients as it contains lesser sugar content.

**Specimens Examined:** INDIA. Kerala: Malappuram Dist., Calicut University Campus (Cultivated), 13 January 2011, Sreejith & A. Joe 123205 (CALI); 04 April 2011, Sreejith & A. Joe 12327 (CALI); Kozhikode Dist., Cherukulathoor (Cultivated), 12 September 2011, Sreejith 123215 (CALI); Thiruvananthapuram Dist. (Cultivated), 17 November 2011, Sreejith 123217 (CALI).

4. *Musa acuminata* Colla (AAA) ‘Dwarf cavendish’  

**Fig. 09**

**Standard Specimen:** INDIA. Tamil Nadu: Coimbatore, TNAU campus (Cultivated at NABI, Mohali, Punjab), 06 May 2013, Siddharth Tiwari 123243 (CALI).


**Local names:** (Kerala) Dwarf cavendish, Khuzhi vazha, Kullan, Morris; (Karnataka) Guja bale, Gujali bale, Kabul bale, Pacha bale, Chukke bale; (Tamil Nadu) Kooli vazhai, Kooni cazhai, Khuzhi vazhai, Kullan, Kuttuvazhai, Morris vazhai, Tharai Matti vazhai, Pacha vazhai; (Andhra Pradesh) Potti pacha arati, Potti bhusawle, Cheetakali; (Maharashtra) Vamanakeli, Chines, Dwarf cavendish, Shedurni, bhusawali, Chittedar, Singpuri, Jahaji, Kabuli, Mauritius, Ardhapuri, Basarai; (Arabia) Maouz Shiny; (Burma) Wet ma lut; (Italy) Banana cavendish; (Malaysia) Pisang
Plants robust, suckers 6–8, very close to parent plant, 8–18 cm away, vertical. Mature pseudostem 1.5–1.8 m high, 55–63 cm circumference at base, yellowish green with maroon pigmentation, covered with ochreous yellow dried sheaths, with large black patches, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color maroon with light yellow patches, shiny; sap watery. Leaf habit erect, lamina 135–163 × 65–84 cm, elliptic, broader towards base, obliquely truncate at apex, with tendril like appendage when young, upper surface dark green, shiny, lower surface dull green, waxy, leaf bases symmetric, both auriculated and rounded, midrib dorsally green, waxy; ventrally whitish green glaucous. Petiole short and stout, 20–27 cm long, waxy, more waxy towards base, with black large and extensive blotches; petiole canal open with spreading, highly winged, margins purple; petiole bases winged and not clasping the pseudostem. Inflorescence pendulous; peduncle 30–50 cm long, green, hairy. Sterile bract one, dorsally green with yellowish green fadings, sometimes with slight maroon tinge, glaucous, ventrally yellowish green, not much grooved with green rudimentary leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip convolute. Female bracts lanceolate, 35–55 × 16–24 cm, slightly grooved, abaxially maroon with yellow or greenish yellow patches, glaucous; adaxially orange-red fades to cream towards base and more orange tip, shining, apex obtuse and split, lifting 1–2 or sometimes 3 bracts at a time, open and reflexed but not revolute back. Basal 7–11 bunches female. Female flowers 12–18 per bract in two rows, 13–15 cm long. Compound tepal 3.6–4.1 × 1.8–2.2 cm, cream, ribbed at dorsal angles, lobes 5, creamy yellow, outer lobes much longer than inner and middle lobe is much broader than others. Free tepal 2.8–3 × 2–2.4 cm, ovate with an abruptly pointed acumen, cream, partially opaque, apex highly corrugated; acumen 0.4–0.6 cm long. Staminodes 5, 1.9–2.5 cm long, white with light greenish base. Ovary 10.3–11.5 cm long, greenish yellow, ovules in 2 regular rows per locule; style 3.3–
3.6 cm long, straight, inserted, white with reddish maroon dots just below stigma; stigma globose, cream, sticky. Male bud lanceolate to intermediate, apex convolute, basal male flowers persistent, tightly arranged without much space between the adjacent male hands, rachis falling vertically, green, 35–43 cm at fruit maturity. Male bracts intermediate to lanceolate, 20–26.5 × 11.2–12.5 cm, slightly grooved, abaxially purplish maroon with yellow patches, glaucous, adaxially orange-red with more yellow towards base and more red towards tip, shiny, colour fades towards base, brittle, apex obtuse and split; lifting 2–3 bracts at a time, just open or slightly reflexed, not revolute, lower bracts persistent, upper scars prominent. Male flowers on average 16–18 per bract in two rows, 5–6.4 cm long, persistent. Compound tepal 3.5–4.2 × 1.1–1.7 cm, apex lobed, curved backwards, cream, ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner, 0.6–1 cm long. Free tepal 2.2–2.4 × 1.2–1.7 cm, white, translucent, oblong, apex highly corrugated, truncate with a prominent acumen, narrow, 0.2–0.3 cm. Stamens 5, 3.7–4.6 cm long; filament 1.2–1.8 cm long, white with light green base; anther 1.9–2.5 cm long, creamy white with white thecae. Ovary rudiment, straight or slightly curved, 1.8–2.3 cm long, creamy white with slight greenish tinge; style straight, inserted, 3.5–3.8 cm long, white with yellow stigma. Fruit bunch compact, with 7–11 hands and 12–18 fruits per hand, in two rows, fingers pedicelled; pedicel 1.5–2.6 cm long with no sign of fusion of pedicel. Fruits on mid hand 12–18 cm long, circumference 14–20 cm, curved back to peduncle, prominently ridged in cross section, apex lengthily pointed, with persistent style base, immature peel colour dark green, fruit on ripening remains green or sometimes slightly yellowish green or during hot weather becomes yellow tinge; immature fruit pulp creamy white, becoming cream on ripening. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is an introduced cultivar and is common in most of the Pacific Islands. In South India, it is common in Kerala and Tamil Nadu,
but for the commercial purpose it is widely cultivated in Tiruchirappalli area of Tamil Nadu. It is generally cultivated as a pure crop. Its fruit had a great demand in many places especially in the city areas. K.C. Jacob (1952) reported that this variety is largely grown in the Canary Islands and from where the fruits are exported to Europe.

**Cytology:** Triploid (AAA) – 2n = 3x = 33 (Morpho-taxonomic scoring = 21 – see APPENDIX II)

**Notes:** The plants are too short with closely arranged, broad and erect leaves. It takes around 13 months to mature from planting to harvest. It produces heavy bunch of fruits almost touching the ground. Due to its dwarf structure, it is generally planted on bits of about 0.5–0.7 m high. The fruits are harvested during cold weather remain nearly green even when ripe whereas those harvested during hot weather become yellow tinge when ripe. The fruit in ripened stage is slightly spicy with agreeable flavour. It is not used as vegetable for cooking purpose.

5. *Musa acuminata* Colla (AAA) ‘Grand naine’

**Standard Specimen:** INDIA. Tamil Nadu: Coimbatore, TNAU campus (Cultivated at NABI, Mohali, Punjab), 06 May 2013, *Siddharth Tiwari 123241* (CALI).

**Local names:** (Kerala) G-nine, Grand naine, High gate; (Tamil Nadu) G-nine, Grand naine; (N.E. India) Harichal, Jahaji, Jahaji kol; (England) Grand naine; (Indonesia) Pisang ambon je pang; (Vietnam) Chuoi va huong.

Plants robust, suckers 4–8, very close to parent plant, 5–17 cm away, vertical. Mature pseudostem 2–2.4 m high, 58–65 cm circumference at base, yellowish green with reddish maroon pigmentation and with large black patches, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color yellowish green with reddish maroon patches, shiny; sap watery. Leaf habit intermediate to drooping, lamina 195–215 × 84–89 cm,
elliptic, broader at middle and tapering towards base and apex, apex obliquely truncate with tendril like appendage when young; upper surface dark green, shiny; lower surface dull green, waxy; leaf bases asymmetric, one rounded and other pointed or in some cases, both rounded, midrib dorsally dull green shiny; ventrally yellowish green glaucous. Petiole short, 35–39 cm long, waxy, more waxy towards base, with large and extensive brown blotches; petiole canal open with spreading, highly winged, margins purple; petiole bases winged, not clasping pseudostem. Inflorescence pendulous, peduncle 60–80 cm long, dark green with blackish pigmentation, hairy. Sterile bract 1, dorsally greenish yellow, margins maroon, glaucous, ventrally cream with maroon pigmentation, tip green, slightly grooved with green rudimentary leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip convolute. Female bracts lanceolate, 32–50 × 13.5–20 cm, minutely grooved, abaxially purplish maroon with yellow green lines; adaxially cream with orange upper part, colour fades to cream towards base, shining; apex obtuse and split; lifting 2–3 bracts at a time, open and reflexed but not revolute back. Basal 9–13 bunches female. Female flowers 18–30 per bract in two rows, 11.3–15 cm long. Compound tepal 3.7–4.1 × 2.1–2.5 cm, cream with rusty brown or black upper part, ribbed at dorsal angles, lobes 5, rusty brown or black and dried. Free tepal 2.7–3 × 2–2.4 cm, obovate, boat-shaped, white or creamy white with more cream upper part, apex highly corrugated with a tapering acumen; acumen 0.4–0.6 cm long. Staminodes 5, 1.4–2.1 cm long, white with light greenish base. Ovary 8.3–10 cm long, pale green with yellow tinge, ovules in 2 regular rows per locule; style 3–3.5 cm long, straight, inserted, white with reddish maroon dots just below stigma; stigma globose, cream, sticky. Male bud lanceolate to intermediate, apex convolute, aborted before fruit maturity, basal 2–5 hand male flowers persistent, rachis falling with a curve, bare, green, 65–83 cm at fruit maturity. Male bracts intermediate to lanceolate, 20–25 × 11.2–13 cm, grooved, abaxially purplish maroon with yellow patches, slightly glaucous, adaxially orange-red with cream base and margins and more red towards tip, shiny, colour fades towards base, brittle,
apex obtuse, sometimes split; lifting 2–3 bracts at a time, just open or slightly reflexed, not revolute, deciduous; scars prominent, compact. Male flowers on average 16–19 per bract in two rows, 5.8–6.3 cm long, deciduous. Compound tepal 3.8–4.2 × 1.3–1.8 cm, apex lobed, curved backwards, cream, ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner, 0.5–0.8 cm long. Free tepal 2–2.2 × 1.7–1.9 cm, white or creamy white, translucent, oblong, apex highly corrugated with prominent acumen, narrow, pointed, 0.4–0.6 cm long. Stamens 5, 3.4–3.6 cm long; filament 1.5–1.6 cm long, white with light green base; anther 1.9–2.1 cm long, creamy white with white thecae. Ovary rudiment, straight or slightly curved, 2.1–2.5 cm long, white with slight yellowish green tip; style straight, inserted, 3.4–3.6 cm long, white; stigma dull yellow, falsely 3-lobed. Fruit bunch compact, with 9–13 hands and 18–30 fruits per hand, in two rows, fingers pedicelled; pedicel 2.5–3 cm long with no sign of fusion of pedicel. Fruits on mid hand 15–23 cm long, circumference 14–20 cm, curved back to peduncle, slightly ridged in cross section, apex lengthily pointed, with persistent floral relicts; immature peel colour dark green, become yellow on ripening; immature fruit pulp creamy white, becoming cream on ripening. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is an introduced cultivar and in India it is found in stray cultivation in North East India and also in some part of Kerala, Andhra Pradesh and Tamil Nadu.

**Cytology:** Triploid (AAA) – 2n = 3x = 33 (Morpho-taxonomic scoring = 24 – see APPENDIX II).

**Notes:** It is a medium sized plant with close set of drooping leaves. It takes around 13–15 months to mature from planting to harvest. ‘Grand naine’ in French means “large-dwarf” and is true to its name in the sense that this plant is not very tall but produces bunches that is almost three-fourth its size with each having more than 200 fruits. The rachis generally falls vertically with a
characteristic bend. The fruit on plant closely resemble to Robusta but on ripening, they turn yellow and moreover it has much longer shelf life than that of Robusta. While the latter tend to drop from the bunch in two to three days after ripening, the former stay intact on the bunch for more than two weeks after ripening, maintaining their peculiar aroma and taste. This quality of the Grand naine which has made them appealing to farmers, markets and consumers.

Specimens Examined: INDIA. Tamil Nadu: Pollachi, (Cultivated), 27 April 2014, K.P. Vimal 123266 (CALI); 27 April 2014, K.P. Vimal 123267 (CALI);

6. Musa acuminata Colla. (AAA) ‘Red’


Musa sapidisiaca K.C.Jacob var. rubra (Feminger) Jacob, Madras Bananas Monogr. pp. 68. 1952. syn. nov.

Musa sapidisiaca K.C.Jacob var. rubra forma venkadaliana Jacob, Madras Bananas Monogr. pp. 68. 1952. syn. nov.

Local names: (Kerala) Chenkadali, Kappa vazha, Chorakadali, Chorapoovan, Chuvanna kappa, Chuvanna chevvazha, Kappa, Malam poovan, Raktha kadali; (Karnataka) Chandra bale, Chontha bale, Kenpu bale, Kunkuma bale, Sakkalathi bale; (Tamil Nadu) Pattu vazhai, Senthuzhuvan, Chevvazhai, Chenkadali; (Andhra Pradesh) Yerra arati, Lal mowze, Yerra chakkarakeli; (Maharashtra) Lalkela, Velchi, Chenkadali, Chandrabale; (Odisha) Lalkadali, Beet java; (W.B. & North-East) Therek marang, Agniswwar, Tulsi manohar, Terekanchi, Lalkela, Ampan; (Burma) Shwe Nget Pyaw; (China) Hong Guo Jiao, Rode Banana, Cuba; (England) Jamaica red banana; (France) Figue rose; (German) Weinrote banana, Kuba banana; (Italy) Banana rosa, Banana di cuba; (Malaysia) Pisang raja udang;
(Netherland) *Banana, rod banana, Red dacca, Claret banana*; (Srilanka) *Rathambala*; (Thailand) *Klue bat*.

Tall and stout plant, suckers 5–10, close to parent plant, 8–20 cm away, vertical or slightly angled. Mature pseudostem 2.9–4 m high, 60–75 cm circumference at base, brownish purple, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color purplish maroon, shiny; sap milky white. Leaf habit intermediate to drooping; lamina 270–390 × 80–92 cm, oblong-lanceolate, apex truncate or obliquely truncate, with tendril like appendage when young; upper surface dark green, dull; lower surface dull green with purplish tinge, waxy; leaf bases slightly asymmetric, both auriculated and rounded; midrib dorsally greenish purple, shiny; ventrally purplish maroon, glaucous. Petiole 65–80 cm long, waxy, more waxy towards base; petiole canal open with spreading, margins purple; petiole bases with large prominent black blotches, winged and clasping the pseudostem. Inflorescence pendulous; peduncle 75–86 cm long, dark brownish purple, hairy. Sterile bracts 2, dorsally dark brownish purple with greenish yellow patches, glaucous; ventrally dark brownish purple with leafy appendage at apex, deciduous. Female bud lanceolate, slightly imbricating at the tip. Female bracts highly brittle, lanceolate, 40–48 × 17–25 cm, minutely grooved, abaxially brownish purple with light yellowish fading towards base and margins, shiny; adaxially reddish purple which fades towards base, shiny, apex obtuse and split, lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 4–10 bunches female. Female flowers 10–18 per bract in two rows, 13–17 cm long. Compound tepal 5.8–6.6 × 2.3–2.6 cm, creamy white with purplish maroon patches at base and more yellowish upper part, ribbed at dorsal angles; lobes 5, yellow with blackish patches, outer lobes much longer than inner. Free tepal 3.7–4.2 × 2.7–3 cm, lanceolate, boat-shaped with a prominent midrib-like central ridge, translucent cream or white, apex highly corrugated and truncate with prominent acumen, acumen 0.4–0.6 cm. Staminodes 5, 2.6–3.8 cm long, white or creamy white with light green base. Ovary 8.5–10 cm long, straight, whitish to yellowish green with purple tip,
ovules in 2 regular rows per locule; style 4.7–5.3 cm long, straight, inserted, white or creamy white; stigma globose, cream, sticky. Male bud top-shaped to intermediate, apex convolute; rachis falling vertically, 90–110 cm at fruit maturity, blackish brown. Male bracts lanceolate to intermediate, 20–25 × 15–17.5 cm, slightly grooved, abaxially dark purplish maroon with violet tinge, glaucous; adaxially reddish maroon, fades to cream towards base, shiny, apex slightly pointed; lifting 1–2 bracts at a time, revolute before falling; bract scars prominent, male bud in advanced blooming top shaped, convolute. Male flowers on average 13–17 per bract in two rows, 7.8–8.2 cm long, normally fall with bract or sometimes persistent. Compound tepal 5.8–6.5 × 2–2.5 cm, apex curved backwards, creamy white with maroon base and black pigmentation on the upper part, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.8–1.2 cm long. Free tepal 3.8–4.2 × 2.4–2.8 cm, white or creamy white, translucent, lanceolate, boat-shaped, apex highly corrugated with prominent acumen; acumen 0.5–0.7 cm long. Stamens 5, 5.5–6 cm long; filament 3–3.3 cm long, white or creamy white; anther 2.5–2.7 cm long, white or creamy white with brownish thecae or completely cream. Ovary rudiment, straight or slightly curved, 2.3–2.5 cm long, creamy white with reddish maroon flesh on the upper part; style straight, inserted, 5.1–5.3 cm long, creamy white with yellow upper part and stigma. Fruit bunch compact, with 4–10 hands and 10–18 fruits per hand, in two rows; fingers shortly pedicelled; pedicel 0.8–2 cm long, fused at the base, bend towards the peduncle. Fruits 14–17 cm long, circumference 14–21 cm, cylindrical without prominent ridges; apex blunt-tipped, with persistent floral relicts, immature peel colour greenish purple, become purple at ripening; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is not generally grown as pure stand, but few plants are cultivated along with other cultivars, especially in hilly areas. The fruits are in great demand in Tamil Nadu, Karnataka and some parts of
Kerala. The cultivation is much more in Tamil Nadu compared to other parts of South India.

**Cytology:** Triploid (AAA) – 2n = 3x = 33 (Morpho-taxonomic scoring = 20 – see APPENDIX II).

**Notes:** It is a long duration crop and takes about 18 months to mature from the time of planting to harvest. It requires heavy doses of manure for successful growth so it also exhausts the soil rather quickly. It is generally known in world wide as ‘Red banana’, hence the name *Red* is accepted here. The intensity of the colour of stem, petiole, midrib and fruit may found slightly varied with altitude and soil type. But taste and flavour of the ripe fruit remains constant.

**Specimens Examined:** INDIA. Kerala: Kozhikode Dist., Mundakkal (Cultivated), 04 May 2011, *Sreejith 123277 (CALI).*

7. **Musa acuminata** Colla (AAA) ‘Robusta’  

**Standard Specimen:** INDIA. Tamil Nadu: Coimbatore, TNAU campus (Cultivated), 06 April 2011, *Siddharth Tiwari 123246 (CALI).*


**Local names:** (Kerala) Anamalu, Robusta, Monsmarie, Sapumal; (Karnataka) Pacha bale, Chukke bale, Yenteedi bale; (Tamil Nadu) Robusta, Pacha vazhai; (Andhra Pradesh) Pada pacha aratti, Pedda bhusaval, Mdras pacha aratti; (Maharashtra) Harichal, Bombay green, Peda pacha arati; (Odisha) Malbhog; (N.E. India) Bongile Jahaji, Jahaji, Borjahali; (Indonesia) *Pisang ambon putin*; (Italy) Banana poyo; (Malaysia) *Pisang buai*; (Netherland) Poyo bananaan; (Philippines) Tudok; (Vietnam) Chuoi Tieu vanh.

Plants robust, suckers 4–8, very close to parent plant, 5–15 cm away, vertical. Mature pseudostem 1.8–2.4 m high, 48–55 cm circumference at base,
maroon with grayish yellow tinge and with large brown patches, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color yellowish green with reddish maroon pigmentation, shiny; sap watery. Leaf habit drooping, lamina 182–198 × 66–74 cm, elliptic, broader at middle and tapering towards base and apex, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green, shiny; lower surface dull green, waxy; leaf bases asymmetric, both sides pointed, midrib dorsally dull green, shiny; ventrally yellowish green glaucous. Petiole very short, 17–25 cm long, waxy, more waxy towards base, with large and extensive brown blotches; petiole canal open with margins spreading, highly winged, margins purple; petiole bases winged and not clasping the pseudostem. Inflorescence pendulous; peduncle 45–54 cm long, dark green with blackish pigmentation, hairy. Sterile bracts 2, dorsally greenish yellow with orange tinge and maroon margins, glaucous; ventrally greenish yellow with maroon pigmentation and green tip, not much grooved with green rudimentary leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip slightly imbricating. Female bracts lanceolate, 32–39 × 12–15 cm, not much grooved, abaxially greenish yellow with purplish maroon base; adaxially yellowish orange with reddish orange upper part and cream base, colour fades to cream towards base, shining, apex obtuse and split, lifting 2–3 bracts at a time, just open or rarely reflexed but not revolute back. Basal 7–10 bunches female. Female flowers 12–22 per bract in two rows, 12–13 cm long. Compound tepal 3.8–4.2 × 1.8–2.2 cm, cream with yellow upper parts, ribbed at dorsal angles; lobes 5, bright yellow, outer lobes much longer than inner and middle lobe much broader than the others. Free tepal 2.2–2.4 × 1.8–2 cm, ovate-oblong, white or creamy white, apex highly corrugated with a broad acumen, 0.4–0.6 cm long. Staminodes 5, 1.7–2.2 cm long, white with greenish yellow base. Ovary 7.8–8.8 cm long, yellowish green or pale green, ovules in 2 regular rows per locule; style 3.3–3.8 cm long, straight, inserted, white with purplish violet dots; stigma globose, creamy white, sticky. Male bud lanceolate to intermediate, apex slightly imbricating; rachis falling vertically with a curve,
dark green, bare, 45–56 cm at fruit maturity. Male bracts intermediate to lanceolate, 20–23 × 9–11 cm, minutely grooved, abaxially purplish maroon, slightly glaucous; adaxially orange-red fades to cream towards base and margins and more red towards tip, shiny, apex obtuse and split; lifting 2–3 bracts at a time, just open or slightly reflexed, not revolute, deciduous along with male flowers; scars prominent. Male flowers on average 12–16 per bract in two rows, 5.3–5.6 cm long, deciduous. Compound tepal 3.4–3.7 × 1.3–1.6 cm, apex lobed, curved backwards, cream, ribbed at dorsal angles, lobes 5, cream or yellow, outer lobes much longer than inner, 0.5–0.9 cm long and middle lobe much broader than others. Free tepal 2.2–2.4 × 1.4–1.6 cm, creamy white, translucent, oblong, apex slightly corrugated with a prominent acumen; acumen narrow, pointed, 0.4–0.6 cm long. Stamens 5, 3.4–3.6 cm long; filament 1.6–1.7 cm long, white with light greenish base; anther 1.9–2.1 cm long, creamy white with grayish thecae. Ovary rudiment, straight or slightly curved, 1.7–2 cm long, cream; style straight, inserted, 3.6–3.8 cm long, white with purple dots; stigma yellow, falsely 3-lobed. Fruit bunch compact, with 7–10 hands and 12–22 fruits per hand, in two rows, fingers pedicelled; pedicel 1.5–2.2 cm long with no sign of fusion of pedicel. Fruits on mid hand 14–22 cm long, circumference 13–18 cm, curved back to peduncle, slightly ridged in cross section, apex pointed, with persistent floral relicts, immature peel colour dark green, which remains on ripening also; immature fruit pulp creamy white, becoming cream on ripening. Seeds completely absent.

Flowering & Fruiting: Throughout the year.

Distribution/ Cultivation: It is widely cultivated in Tamil Nadu and is also common in other states like Andhra, Telangana, Karnataka, Kerala, etc. It is generally cultivated as a pure crop. Its fruit had a great demand in many places especially in the city areas and is one of the most economic crops in Tamil Nadu. It is very widely produced by tissue culture techniques and is
commonly available in Nurseries and is also supplied to the farmers through local bodies like *Krishi Bhavan*, etc.

**Cytology:** Triploid (AAA) – $2n = 3x = 33$ (Morpho-taxonomic scoring = 23 – see APPENDIX II).

**Notes:** It is a medium sized plant with close set of drooping leaves. It takes around 12–15 months to mature from planting to harvest. The name ‘Robusta’ comes from its robust appearance of the pseudostem. Many breeding experiments were done on this cultivar and produces many improved cultivars like ‘Dwarf cavendish’, ‘Grand naine’ etc. The fruit on plant closely resemble to the ‘Grand naine’ and ‘Dwarf cavendish’ but it remains the green colour even after ripening and moreover it has much lesser shelf life than the *Grand naine*. The fruit also has a characteristic aroma.

*Specimens Examined:* INDIA. Kerala: Kozhikode, Poovattuparamba (Cultivated), 03 May 2015, Sreejith 123274 (CALI).

8. *Musa × paradisiaca* L. (AB) ‘Kunnan’

**Standard Specimen:** INDIA. Kerala: Malappuram Dist., Panambra, Elampilasseri (Cultivated), 16 November 2012, Sreejith & A. Joe 123236 (CALI).


**Local names:** (Kerala) Adukkan, Amirthapani, Annaan, Kannan, Kunnan, Nadan kunnan, Valia kunnan, Adukvan, Adukku poovan, Kulamekkula; (Karnataka) Chitti bale, Firige bale; (Tamil Nadu) Poong kadali, Vella kadali, Nar kadali; (Andhra Pradesh) Amirthpani, Chakkara keli, Chinna sugantham, Ginni, Karpura chakkara keli, Madras aratti, Neechu, Sanna aakulu chettu, Sangantha; (Odisha) Patti mokiri, Sudha.
Plants slender, suckers 4–7, not much close to parent plant, 13–22 cm away, vertical or slightly angled. Mature pseudostem 2.1–2.4 m high, 35–50 cm circumference at base; yellowish green with maroon pigmentation and covered with white dried sheaths, with blackish patches, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color greenish white with slight purplish maroon fadings, shiny; sap watery. Leaf habit erect; lamina 145–155 × 50–60 cm, linear-lanceolate, obliquely truncate at apex, with tendril like appendage when young, upper surface dark green, shiny, lower surface dull green, waxy, leaf bases symmetric, both rounded; midrib dorsally green waxy; ventrally whitish green glaucous. Petiole 42–50 cm long, waxy, more waxy towards base, with black scattered blotches; petiole canal slightly curved inwards, purple; petiole bases not winged and clasping the pseudostem. Inflorescence sub-horizontal or oblique, peduncle 30–45 cm long, green with black dots, glabrous, glaucous. Sterile bracts 2, dorsally yellowish green with dark maroon fadings, much more in the second one and sometimes maroon with yellowish fading, glaucous, ventrally maroon with yellow or greenish yellow patches towards base and margins, not much grooved with green rudimentary leafy appendage at apex, deciduous. Female bud linear-lanceolate, imbricate at tip. Female bracts lanceolate, 25–30 × 10–12 cm, slightly grooved, abaxially dark blackish maroon, with yellowish patches, glaucous; adaxially dark reddish maroon, colour slightly fades towards base, shining, apex obtuse and split, lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 5–9 hands female. Female flowers 9–14 per bract in two rows, 9.5–12.2 cm long. Compound tepal 4–4.4 × 1.5–2 cm, cream with maroon patches and more yellowish lobes, ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner. Free tepal 2.4–3 × 1.5–2 cm, obovat, cream, translucent, apex highly corrugated with a prominent and broadly truncate acumen, 0.4–0.6 cm long. Staminodes 5, 1.2–1.7 cm long, white with light greenish base. Ovary 6.5–7.8 cm long, dull yellowish green, ovules in 2 regular rows per locule; style 3.8–4.5 cm long, straight, inserted, white with reddish maroon dots just below stigma; stigma
globose, cream or greyish yellow, sticky. Male bud lanceolate to intermediate, highly imbricate at apex, rachis falling at an angle, blackish brown, bare, 65–85 cm long at fruit maturity. Male bracts intermediate to lanceolate, 15–19 × 8.1–10 cm, not grooved, abaxially dark purplish maroon with slight blackish markings, glaucous; adaxially dark reddish maroon, shiny, no mark of colour fading, apex intermediate to obtuse, not split; lifting 1–2 bracts at a time, reflexed and revolute before falling; bract scars prominent. Male flowers on average 14–18 per bract in two rows, 5–6 cm long, fall with the bract. Compound tepal 3.3–4.1 × 1–2.2 cm, apex lobed, curved backwards, cream with maroon patches, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.4–0.6 cm long. Free tepal 1.8–3 × 1.2–1.8 cm, white or cream, translucent, oblong, boat-shaped, apex highly corrugated with a prominent acumen, narrow, 0.4–0.6 cm long. Stamens 5, 3.2–4 cm long; filament 1.9–2.2 cm long, cream; anther 1.3–2 cm long, cream with purplish maroon thecae. Ovary rudiment, straight, 1.5–2.1 cm long, cream or creamy white with slight maroon patches; style curved at base, exserted 3.7–4.1 cm long, white or creamy white; stigma dull yellow. Fruit bunch compact, with 5–9 hands and 9–14 fruits per hand, in two rows, fingers pedicelled; pedicel 1.5–2 cm long with no sign of fusion of pedicel. Fruits on mid hand 8.5–11.5 cm long, strait, circumference 8–12 cm, rounded in cross section; apex bottle-necked, with persistent floral relicts, immature peel colour dark green, become bright yellow with black dots at maturity; immature fruit pulp white, becoming creamy white with little bit hard at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is a medium sized plant found in stray cultivation throughout South India especially in the backyards. Since this produces much small and lesser number of fruits compared with other common cultivars such as *Poovan*, etc., it is not grown as pure stand anywhere.
**Cytology:** Diploid (AB) – 2n = 2x = 22 (Morpho-taxonomic scoring = 48 – see APPENDIX II).

**Notes:** It takes around 15 to 16 months to mature from planting to harvest. It is a medium sized plant with small, narrow and erect leaves. The unripe fruits are used for culinary purpose and the dried fruit powder is used as a baby-food, especially in the rural areas of Kerala. The ripened fruits are also consumed as raw.

**Specimens Examined:** INDIA. **Kerala:** Kozhikode Dist., Chevayur (Cultivated), 06 April 2011, *Sreejith 123251* (CALI); Pantheerankavu, Athaani (Cultivated), 03 May 2015, *Sreejith 123276* (CALI); Malappuram Dist., Kondotty (Cultivated) *Ahmadul Kabeer 123249* (CALI); Thiruvananthapuram Dist. (Cultivated at Malabar Botanical Garden, Olavanna), 17 May 2012, *Sreejith 123229* (CALI).


**Standard Specimen:** INDIA. **Kerala:** Thiruvananthapuram Dist. (Cultivated at Malabar Botanical Garden, Olavanna), 17 May 2012, *Sreejith 123231* (CALI).


**Local names:** (Kerala) *Matti, Mattippazham, Mattippoovan*; (Tamil Nadu) *Kunnan Matti, Mattippoovan*.

Plants slender, suckers 4–8, not much close to parent plant, 10–20 cm away, vertical or slightly angled. Mature pseudostem 2.3–2.8 m high, 40–53 cm circumference at base; yellowish green with maroon pigmentation and covered with white dried sheaths, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color greenish white with slight purplish maroon patches, shiny; sap watery. Leaf habit erect; lamina 150–175 × 50–64 cm, linear-lanceolate, obliquely truncate at apex, with tendril like
appendage when young, upper surface dark green, shiny, lower surface dull green, waxy, leaf bases symmetric, both rounded; midrib dorsally green waxy; ventrally dull green glaucous. Petiole 46–65 cm long, waxy, more waxy towards base, with large and extensive black blotches; petiole canal straight or sometimes slightly curved inwards, purple; petiole bases not winged and clasping the pseudostem. Inflorescence sub-horizontal or oblique, peduncle 40–50 cm long, light or yellowish green with slight maroon tinge and black dots, glabrous, glaucous. Sterile bracts 2, dorsally yellowish green with maroon shades, much more in the second one and sometimes maroon with yellowish fading, glaucous, ventrally maroon with yellow or greenish yellow patches towards base and margins, not much grooved with green rudimentary leafy appendage at apex, deciduous. Female bud linear-lanceolate, imbricate at tip. Female bracts lanceolate, 27–32 × 10.5–16 cm, slightly grooved, abaxially dark blackish maroon with purple tinge, highly glaucous; adaxially reddish maroon with slight purplish tinge, no sign of colour fadings towards base, shining, apex intermediate and sometimes split, lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 5–10 hands female. Female flowers 10–15 per bract in two rows, 9.5–12.5 cm long. Compound tepal 4.1–4.4 × 1.5–2.1 cm, cream with maroon patches and more yellowish lobes, ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner, 0.5–0.6 cm long. Free tepal 2.5–3 × 1.5–2 cm, obovate, cream, translucent, apex highly corrugated and broadly truncate acumen, 0.5–0.6 cm long. Staminodes 5, 1.3–2.2 cm long, white with light greenish base. Ovary 6.6–8 cm long, dull yellow with or without greenish tinge, ovules in 2 regular rows per locule; style 3.9–4.3 cm long, straight, inserted, white with reddish maroon dots just below stigma; stigma globose, cream or greyish yellow, sticky. Male bud lanceolate to intermediate, highly imbricate at apex; rachis falling at an angle, blackish brown, bare, 62–95 cm long at fruit maturity. Male bracts intermediate to lanceolate, 16–22 × 8.1–12.2 cm, not grooved, abaxially purplish maroon, glaucous; adaxially reddish maroon, shiny, no mark of colour fading, apex intermediate to obtuse, not split; lifting
1–2 bracts at a time or sometimes 3, revolute just before falling; bract scars prominent. Male flowers on average 14–18 per bract in two rows, 5–7 cm long, fall with the bract. Compound tepal 3.8–4.7 × 0.9–2.2 cm, apex lobed, curved backwards, cream with maroon patches, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.4–0.6 cm long. Free tepal 2–3 × 1.5–1.8 cm, cream, translucent, oblong, boat-shaped, apex highly corrugated with a prominent narrow acumen, 0.6–1 cm long. Stamens 5, 3.2–4.3 cm long; filament 1.7–2.2 cm long, cream; anther 1.4–2 cm long, cream with pinkish purple thecae. Ovary rudiment, straight, 1.6–2.5 cm long, cream or creamy white with slight maroon patches; style curved at base or in some cases straight, exserted 3.7–4.5 cm long, white or creamy white with or without reddish dots just below stigma; stigma dull yellow. Fruit bunch compact, with 5–10 hands and 10–15 fruits per hand, in two rows, fingers pedicelled; pedicel 2.3–3 cm long with no sign of fusion of pedicel. Fruits on mid hand 8–11 cm long, curved, circumference 8–12 cm, rounded or slightly ridged in cross section; apex bottle-necked, with persistent floral relicts, immature peel colour dark green, become bright yellow with black dots at maturity; immature fruit pulp white, becoming creamy white at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is rare plant and there is no commercial/large scale production anywhere except in some small areas nearby Nagarcoil in Tamil Nadu district and very rarely in some backyards of farmer’s house in Kerala.

**Cytology:** Diploid (AB) – 2n = 2x = 22 (Morpho-taxonomic scoring = 47 – see APPENDIX II).

**Notes:** It takes around 14 to 15 months to mature from planting to harvest. It is a medium sized plant with small, narrow and erect leaves. Since it helps for easy digestion, this fruit is widely given to the 3–12 month old babies.
**Specimens Examined:** INDIA. **Kerala:** Thiruvananthapuram Dist. (Cultivated at Malabar Botanical Garden, Olavanna), 17 May 2012, Sreejith 123229 (CALI). **Tamil Nadu:** Kanyakumari Dist., Nagarcoil, 30 October 2015, Drisya & T. Kottekkattu 123284 (CALI).

10. *Musa × paradisiaca* L. (AB) ‘Neypoovan’

**Specimens Examined:** INDIA. **Kerala:** Kozhikode Dist., Mundakkal (Cultivated), 06 April 2011, Sreejith 123208 (CALI).


*Local names:* (Kerala) Adakka poovan, Ari poovan, Kadali poovan, Kunnan poovan-kadali, Kunnan poovan, Madhura annan, Ney kadali, Neypoovan, Nhali poovan, Nhani poovan, Thekkan kadali, Tirunelli poovan, Thulunaattu kadali, Vadakkan kadali, Rani poovan; (Karnataka) Deva bale, Hoo bale, Elakkie bale, Puttu sugantha, Poo bale, Mitga bale, Mitli; (Tamil Nadu) Mysore rashtali, Rasakadali, Elarasi, Poonkadali, Pacharasi; (Andhra Pradesh) Mysore rashtali, Karpura aratti, Rasadala; (Maharashtra) Safed velchi; (Odisha & W.B.) Chini champa, Kanthali champa; (North-East) Somai.

Plants slender, suckers 2–5, not much close to parent plant, 9–17 cm away, vertical or slightly angled. Mature pseudostem 2.5–3.5 m high, 50–58 cm circumference at base, yellowish green, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color whitish green with some purplish blotches, shiny, sap milky white. Leaf habit intermediate to drooping; lamina 165–215 × 53–65 cm, oblong-lanceolate, obliquely truncate or truncate at apex, with tendril like appendage when young, upper surface dark green, dull; lower surface light green, waxy; leaf bases asymmetric, both rounded or one side rounded and other pointed; midrib dorsally yellow-green, glaucous, ventrally dark green. Petiole 60–75 cm long, waxy, more waxy towards base; petiole canal margins curved inwards, purple; petiole bases
winged and clasping the pseudostem, with black or black-brown scattered blotches. Inflorescence horizontal and become sub-horizontal or oblique; peduncle 32–46 cm long, light green with maroon pigmentation, slightly pubescent. Sterile bracts 2, dorsally yellowish green with maroon fading, ventrally maroon with green leafy appendage at the apex, deciduous. Female bud lanceolate, convolute or slightly imbricate at tip. Female bracts lanceolate, 27–36 × 14–20 cm, moderately grooved, abaxially dark maroon with or without light yellow patches, glaucous; adaxially reddish maroon, shiny, no sign of colour fadings; apex obtuse and sometimes split, lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 6–10 bunches female. Female flowers 10–18 per bract in two rows, 11.3–15 cm long. Compound tepal 4.5–5.7 × 1.9–2.9 cm, creamy white with maroon tinge, ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner. Free tepal 3.1–3.4 × 1.7–2.2 cm, lanceolate, boat-shaped, translucent cream or white with slight purple tinge, apex highly corrugated and truncate without a prominent acumen. Staminodes 5, 1.7–3.8 cm long, white or creamy white with light green base. Ovary 7.3–10.2 cm long, straight, pale green with or without a purple patches at the base and tip, ovules in 2 regular rows per locule; style 4.4–5.1 cm long, straight, inserted, white with reddish maroon dots just beneath stigma, stigma globose, cream or grey, sticky. Male bud lanceolate to intermediate, highly imbricate at apex; rachis falling at an angle, dark brown or blackish brown, 78–86 cm long at fruit maturity. Male bracts lanceolate to intermediate, 14–20.3 × 8.3–13.5 cm, slightly grooved; abaxially dark purplish maroon, glaucous; adaxially maroon, shiny, no sign of colour fadings; apex obtuse and sometimes split; lifting 1–2 bracts at a time, revolute before falling; bract scars prominent; male bud in advanced blooming top shaped, almost convolute. Male flowers on average 13–19 per bract in two rows, 6.3–7.8 cm long, fall with bract. Compound tepal 4.8–5.8 × 1.3–1.9 cm, apex curved backwards, creamy white with purplish strands, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.5–0.8 cm long. Free tepal 2.6–3 × 1.3–1.9 cm, lanceolate, creamy white with purple
coloration, translucent, boat-shaped, apex highly corrugated with a prominent acumen 0.4–0.6 cm long. Stamens 5, 4.8–5.5 cm long; filament 2.5–3.5 cm long, creamy white; anther 2–3 cm long, creamy white with brownish thecae or completely cream. Ovary rudiment, straight, 1.5–2.1 cm long, creamy white with or without a purplish base; style straight, inserted, 4.5–5.2 cm long, creamy white with purple dots towards tip, stigma pale yellow. Fruit bunch lax, with 6–10 hands and 10–18 fruits per hand, in two rows, fingers pedicelled, bend towards the peduncle; pedicel 1.8–2.5 cm long, base with no sign of fusion. Fruits 7–11.5 cm long, circumference 8–11 cm, slightly ridged, apex bottle-necked, with persistent floral relics, immature peel colour dark green, become bright yellow and very thin at maturity; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is widely cultivated throughout South India, especially in Malabar area where the plants are grown in the backyards of almost all houses for leaves as well as fruits.

**Cytology:** Diploid (AB) – 2n = 2x = 22 (Morpho-taxonomic scoring = 47 – see APPENDIX II).

**Notes:** It takes around 13 months to mature from planting to harvest. It does not need any special care and hence commonly cultivated in home gardens. It is not grown as pure stand anywhere and is not a chief commercial variety. The fruit has a tendency to crack if irrigation be continued even after the fruits are ¾ fill. It is largely grown as a rain-fed crop on the Malabar area and the fruits are highly delicious.

**Specimens Examined:** INDIA. **Kerala:** Kozhikode Dist., Mundakkal (Cultivated), 12 September 2011, Sreejith 123215 (CALI); Pantheerankavu, Athaani (Cultivated), 03 May 2015, Sreejith 123275 (CALI); Malappuram Dist., Calicut University Botanical Garden (Cultivated), 17 November 2011,
Sreejith 123217 (CALI); ibid., 17 November 2011, Sreejith 123223 (CALI); Thrissur Dist., Palakkuzhi (Cultivated), April 2012, A. Joe 130747 (CALI).


*Fig. 16*

**Standard Specimen:** INDIA. Kerala: Kozhikode Dist., Mundakkal (Cultivated), 06 April 2011, Sreejith 123210 (CALI).


**Local names:** (Kerala) Chundilla kunnan, Chundillan, Kodapilla kunnan, Koombilla annan, Koombilla chingan, Koombilla kannan, Koombilla poovan, Mambilla kunnan, Maniyilla kunnan, Kunnan, Taen kunnan, Thattilla kunnan; (Tamil Nadu) Poo vazhai, Poola chundan, Poong kadali, Poovilla vazhai; (Karnataka) Kaththe bale, Mambilla, Rundu bale; (Andhra Pradesh) Benda atratti, Chitrachalam, Godavari keli; (Ceylon) Suwandel.

Plants medium stout, suckers 1–5, not much close to parent plant, 10–25 cm away, vertical or slightly angled. Mature pseudostem 2.7–3.5 m high, 46–65 cm circumference at base, slightly yellowish green with black and brownish purple patches, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color yellowish green with maroon pigmentation, shiny; sap watery. Leaf habit intermediate to erect, lamina 215–268 × 63–77 cm, linear-lanceolate, obliquely truncate at apex, with tendril like appendage when young, upper surface dark green, lower surface dull green, waxy; leaf bases slightly asymmetric, both rounded; midrib dorsally green; ventrally dull green with slight yellowish tinge, glaucous. Petiole 45–51 cm long, waxy, more waxy towards base; petiole canal margins straight with erect and purplish maroon margins; petiole bases not winged and clasping pseudostem, with black and maroon sparse blotches along base.
Inflorescence pendulous; peduncle 50–73 cm long, dark green without any pigmentation, not pubescent, glaucous. Sterile bracts 2, dorsally purplish maroon with greenish yellow patches, glaucous; ventrally maroon with greenish yellow patches towards base and margins, not much grooved with a little but not much developed green leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip minutely imbricate. Female bracts lanceolate, 23.7–37 × 7–13 cm, slightly grooved, abaxially dark blackish maroon with yellowish green tip, glaucous; adaxially reddish maroon which fades towards base and tip, shining, apex pointed to obtuse and split, lifting 2–4 bract at a time, open reflexed and slightly revolute at tip just before falling. All bunches female (6–14) or in some cases first 5–7 hands female then produces 6–11 hands hermaphrodite or male and again female; but with less manure and water stress conditions, especially in hot summer, it produces 4–7 hands of female followed by male flowers as in the other cultivars. Female flowers 8–16 per bract in two rows, 10–13.8 cm long. Compound tepal 4.3–5.6 × 1.5–2.2 cm, creamy white with maroon patches and more yellow lobes, ribbed at dorsal angles; lobes 5, yellow, outer and middle lobes longer than inner. Free tepal 2.5–3 × 1.5–2.3 cm, ovoid to lanceolate, cream, apex highly corrugated with a pointed acumen, 0.4–0.6 cm long. Staminodes 5, 2–3.5 cm long, white with yellowish green base. Ovary 6.5–8.5 cm long, pale green, ovules in 2 regular rows per locule, style 3.7–4.4 cm long, straight, white without pigmentation, stigma globose, cream, sticky. Normally male bud and male flowers completely absent and the last bunch develop in to fruits. But in some cases it also produces male bud and flowers; male bud lanceolate, imbricate at apex; rachis falling vertically, dark green, 45–53 cm at fruit maturity. Male bracts lanceolate, 20–22 × 8–8.8 cm, grooved; abaxially dark blackish purple, glaucous, adaxially reddish maroon, shiny, no sign of colour fading, apex obtuse and split; lifting 1–2 bracts at a time, reflexed and revolute before falling; bract scars scarcely prominent. Male flowers on average 8–12 per bract in two rows, 7.5–7.8 cm long, fall with the bract or sometimes upper 3–4 bunches of rudimentary ovary persistent even up to fruit.
maturity. Compound tepal 5.4–5.8 × 1.3–1.6 cm, apex curved backwards, cream with maroon patches and yellow lobes, slightly ribbed at dorsal angles; lobes 5, yellow, outer and middle lobes much longer than inner, 0.4–0.6 cm long. Free tepal 2.4–2.7 × 1.8–2 cm, creamy white with maroon tinge, opaque, oblong-ovate, boat-shaped; apex highly corrugated with prominent pointed acumen, 0.4–0.6 cm long. Stamens 5, 4–4.5 cm long; filament 2–2.8 cm long, cream, anther 1.8–2.2 cm long, creamy white with brownish violet thecae. Ovary rudiment, straight, 2.2–2.3 cm long, creamy white without pigmentation; style straight, inserted 4.5–4.7 cm long, white without pigmentation, stigma dull yellow; stigma globose, sometimes bifid, dull yellow. Fruit bunch lax, with a curve. Peduncle 55–65 cm long, 20–25 cm girth; 5–14 hands and 8–16 fruits per mid-hand, in two rows, fingers pedicelled; pedicel long, 4–6 cm. Fruits on mid hand 12.5–16 cm long, circumference 11–15 cm, curved, pronouncedly ridged in cross section, apex lengthily pointed, with persistent style base, immature peel colour dark green, become yellow with greenish tinge and some black markings at ripening, yellow at over-ripened stage and easily falloff; immature fruit pulp pure white, which retains even after ripening and very sweet at maturity. Seeds completely absent.

Flowering & Fruiting: Throughout the year.

Distribution/ Cultivation: It is very rare cultivar found in stray cultivation in Kerala and some part of Tamil Nadu and also in some part Andhra and Karnataka.

Cytology: Diploid (AB) – 2n = 2x = 22 (Morpho-taxonomic scoring = 47 – see APPENDIX II).

Notes: It takes around 16–18 months to mature from planting to harvest. The fruits very sweet and that is how it got the name Thaenkunnan (in Malayalam, Thaen means Honey). It is a medium size plant with medium sized leaves and bunch with pronouncedly ridged and lengthily pointed fruits. Normally it
produces only pistillate flowers (female only) and all develops in to fruits or in some cases, it may produce 4–7 hands of pistillate flowers and then some hermaphrodite or male flowers followed by female flowers, so that the mature bunch has fruits from base to tip or at the basal and the tip portions with a naked middle rachis. But during hot summer, it produces normal bunches of 4–6 female flowers followed by male. K.C. Jacob (1952) treated the later one under the variety *M. sapidisiaca* var. *thaenkunnaniana* and the former forma *thatillakunnaniana* under the variety. But both the conditions were seen in the same clump. The fruit is very sweet and pure white in colour, but it has very short shelf life and it falloff very easily.

**Specimens Examined:** INDIA. Kerala: Kozhikode Dist., Mundakkal (Cultivated), 20 April 2015, *Sreejith 123272* (CALI); Malappuram Dist., Kuttippuram, (Cultivated), 03 January 2015, *Sreejith & C. Pramod 123210* (CALI).

12. *Musa × paradisiaca* L. (AAB) ‘Namarai’

**Standard Specimen:** INDIA. Tamil Nadu: Kolli Hills Koochakarai Paatty (Cultivated), 01 January 2014, *Sreejith & A. Kabeer123252* (CALI).


**Local names:** (Tamil Nadu) Mala vazhai, Mala vazha, Namarai, Nimaran.

Plants normal; suckers 4–6, close to parent plant, 6–15 cm away, vertical. Mature pseudostem 2.7–3.2 m high, 46–55 cm circumference at base, yellowish green with black or blackish brown patches, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color whitish yellow with slight maroon pigmentation, shiny; sap watery. Leaf habit intermediate to drooping, lamina 215–245 × 63–67 cm, linear-lanceolate, obliquely truncate at apex, with tendril like appendage when young, upper surface dark green, lower surface dull green, waxy; leaf bases symmetric,
both auriculated and rounded; midrib dorsally yellowish green, ventrally dull green with slight yellowish tinge, glaucous. Petiole 45–51 cm long, waxy, more waxy towards base; petiole canal margins wide with erect, margins blackish brown; petiole bases slightly winged and clasping pseudostem, base with scattered blackish blotches. Inflorescence horizontal become sub-horizontal or oblique at fruit maturity; peduncle 60–70 cm long, dark green without any pigmentation, glabrous, glaucous. Sterile bracts 2, dorsally greenish yellow with maroon patches, much more in the second one, ventrally maroon with greenish yellow patches towards base and margins, slightly grooved with a little but not much developed green leafy appendage at the apex, deciduous. Female bud linear-lanceolate, tip imbricate. Female bracts lanceolate, 28–35 × 15–18.5 cm, slightly grooved, abaxially dark blackish maroon with or without yellowish green patches and with red tip, glaucous; adaxially reddish maroon with orange tinge, no sign of colour fading, shining, apex obtuse and sometimes split, lifting one bract at a time or rarely two, reflexed and revolute before falling. Basal 5–7 bunches female. Female flowers 10–16 per bract in two rows, 11–12.5 cm long. Compound tepal 4–4.3 × 1–1.5 cm, creamy white with reddish maroon base, which fades towards tip, ribbed at dorsal angles; lobes 5, yellow, outer lobes slightly longer than inner and curved back. Free tepal 2.7–2.9 × 2.1–2.3 cm, ovoid, cream; apex corrugated with pointed acumen, 0.5–0.6 cm long. Staminodes 5, 1.9–2.7 cm long, white with yellowish green base. Ovary 7.8–8.3 cm long, light yellowish green, ovules in 2 regular rows per locule; style 3.9–4.2 cm long, straight, inserted, white with purplish violet middle part; stigma globose, cream, sticky. Male bud intermediate to top-shaped, imbricate at apex; rachis falling vertically, blackish brown, 75–83 cm at fruit maturity. Male bracts lanceolate to intermediate, 17.5–20 × 12–13.5 cm, grooved, abaxially dark brownish purple, glaucous; adaxially reddish maroon, shiny, no sign of colour fading, apex intermediate–obtuse and sometimes split; lifting 1–2 bracts at a time, reflexed and revolute before falling; bract scars prominent. Male flowers on average 12–14 per bract in two rows, 5.7–6.1 cm long, normally fall with
bract or sometimes upper 3–4 bunches persistent. Compound tepal 4.5–4.8 × 1.5–1.9 cm, apex curved backwards, cream with maroon patches and yellow lobes, ribbed at dorsal angles; lobes 5, yellow, outer lobes and middle lobe much longer than inner, 0.5–0.7 cm long. Free tepal 2.3–2.5 × 1.7–2 cm, white, opaque, oblong-ovate, boat-shaped; apex corrugated with a prominent pointed acumen, 0.3–0.4 cm long. Stamens 5, 4.2–4.5 cm long; filament 2.1–2.3 cm long, white or creamy white; anther 1.8–2.1 cm long, white or creamy white with brownish violet thecae. Ovary rudiment, straight, 1.8–2 cm long, cream with purple fleshy patches; style curved at base, inserted 4–4.5 cm long, white with purple dots and dull yellow stigma. Fruit bunch lax, with 5–7 hands and 10–16 fruits per hand, in two rows, fingers pedicelled; pedicel 1.9–2.2 cm long. Fruits on mid hand 13.5–15 cm long, straight in the distal part, circumference 10–14 cm, pronouncedly ridged in cross section, apex pointed, with persistent style base, immature peel colour dark green, become yellow with some black markings at maturity; immature fruit pulp white, becoming cream soft and very sweet at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is rare hill banana grown as scattered units along with other cultivars in the hilly areas of Tamil Nadu. The main cultivation is restricted to Palani, Kolli and Sirumalai hills of Tamil Nadu. It can also thrive in the plains of Tamil Nadu and also produces much larger bunches than in its natural habitat.

**Cytology:** Triploid (AAB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 44 – see APPENDIX II).

**Notes:** It takes around 13 months to mature from planting to harvest. It is a slender plant with medium sized leaves and bunch with smaller and easily falling fruits. The fruit is widely exported to Palani temple for the preparation of “Panchamritham”. For this purpose only it is cultivated in some hilly areas and now become one of the major economic crops of the local peoples in
these areas. Recently many local dailies reported that this variety is to be extinct because of the issues of the land from where it is cultivated. The fruit is very juicy, sweet and with a good flavour but the major defect is that it has short shelf life and falloff soon after maturity.


**Standard Specimen:** INDIA. Kerala: Malappuram Dist., Panambra (Cultivated), 24 January 2012, Sreejith 123218 (CALI).


**Local names:** (Kerala) Attu nendran, Chengalikodan, Chengazhikodan, Eththakka, French plantain, Giant plantain, Horn plantain, Kal eththan, Malai ethan, Manjeri Moongil, Mysore Ethan, Nendran, Nana nendran, Nedu nendran, Nendran, Neockon, Ottamoongil, Pindi eththan, Randupadala,
Plants normal; suckers 3–8, close to parent plant, 8–17 cm away, vertical or slightly angled. Mature pseudostem 2.6–3.3 m high, 45–65 cm circumference at base, green to yellowish green, with blackish patches, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color whitish green with some purplish blotches, shiny; sap watery. Leaf habit drooping; lamina 190–220 × 65–70 cm, oblong, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green, shiny; lower surface dull green, waxy; bases asymmetric, one rounded and one pointed; midrib dorsally dull green, ventrally whitish green with slight yellowish tinge, glaucous. Younger leaves with some brownish purple patches at the lower surface. Petiole 35–57 cm long, waxy, more waxy towards base; petiole canal margins pinkish purple to red, curved inwards; petiole bases not winged and clasping the pseudostem, without blotches or if present, very small scattered brownish dots. Inflorescence pendulous; peduncle 45–60 cm long, dull green without any pigmentation, glabrous, glaucous. Sterile bracts 2, dorsally yellowish green with maroon tinge, much more in the second one; ventrally maroon with yellowish green margins, slightly grooved without much developed green leafy appendage at apex, deciduous. Female bud linear-lanceolate, slightly imbricate at tip. Female bracts lanceolate, 28–38 × 13–18 cm, not much grooved, abaxially dark blackish purple with greenish yellow patches, glaucous; adaxially reddish maroon with yellowish patches towards margins, no sign of colour fading, shining, apex obtuse and split,
lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 5–8 bunches female. Female flowers 8–10 per bract in two rows, 16–19 cm long. Compound tepal 4.4–4.7 × 2.2–2.5 cm, cream with orange-yellow lobes, ribbed at dorsal angles; lobes 5, orange-yellow, outer lobes much longer than inner. Free tepal 3.2–3.5 × 2.2–2.4 cm, ovate, white with yellow patches, apex highly corrugated and truncate with a broad acumen, 0.6–0.9 cm long. Staminodes 5, 3.1–3.9 cm long, white with light green base and grayish tip. Ovary 13.5–14 cm long, light yellowish green with slightly purplish pedicel, ovules in 2 regular rows per locule; style 3.9–4.2 cm long, straight, inserted, white; stigma globose, cream or greyish yellow, sticky. Male bud lanceolate, highly imbricate at apex; rachis falling vertically, blackish brown, with persistent male flowers and bracts, 48–64 cm at fruit maturity. Male bracts lanceolate, 24–29 × 13–14.8 cm, not much grooved; abaxially purplish maroon, slightly glaucous; adaxially reddish maroon, no sign of colour fading towards base, shiny, colour uniform, apex obtuse and split; lifting 1–3 bracts at a time, reflexed and revolute; male bud in advanced blooming slightly top-shaped, mostly male bract and male flowers persistent up to fruit maturity; if falls, then bract scars prominent. Male flowers on average 9–12 per bract in two rows, 8–9.3 cm long, mostly persistent along with the bract. Compound tepal 5.2–5.8 × 1.5–1.8 cm, apex curved backwards, cream, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.5–0.9 cm long. Free tepal 3–3.3 × 2.6–2.8 cm, white or creamy white, partially opaque, ovate-oblong, apex highly corrugated with a prominent acumen, 0.6–0.9 cm long. Stamens 5, 4.6–5 cm long; filament 2.4–2.7 cm long, white or creamy white; anther 2.4–2.7 cm long, cream or light yellow with white thecae. Ovary rudiment, straight, 3–3.3 cm long, white or creamy white with light greenish tinge; style straight, inserted 4.8–5.3 cm long, white with reddish dots just below stigma; stigma yellow. Fruit bunch lax, with 5–8 hands and 8–10 fruits per hand, in two rows, fingers pedicelled; pedicel 3.7–4.3 cm long, no sign of fusion of pedicel. Fruits on mid hand 20–27 cm long, straight in the distal part, circumference 14–18 cm, pronouncedly ridged in cross section, apex
lengthily pointed, with floral relicts, immature peel colour dark green, become brownish yellow with black marks at maturity; immature fruit pulp grayish white, becoming creamy yellow and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is extensively cultivated as a rain-fed crop especially in the Western Coasts of South India. It is one of the major economic crops in many rural areas.

**Cytology:** Triploid (AAB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 38 – see APPENDIX II).

**Notes:** It has been under cultivation on the Malabar Coast from time immemorial. It is largely grown as pure stand crop. It takes about 11 months to mature from the time of planting to the harvest stage. It is planted year after year from fresh suckers. This fruit is a major ingredient in various dishes in Malabar cuisine and is an essential element at the banquets of the Malayali population during their festivities. Ripe fruits are ordinarily consumed after steaming. Banana figs and halva made with ripe fruits are popular and delicious. The porridge made from ripened fruits form an integral part of Sadhya during Onam and other festive occasions. The unripe fruit is used for culinary purpose and serves as a side-dish for a meal of rice. Banana chips are another popular one and are made by frying the sliced fruits in coconut oil, which can be kept well for 2–3 months and are even exported to Baghdad in exchange for dates from that region. The flour obtained from the unripe banana is also utilized as food.

In addition to the normal cultivar some ecotypes were also identified. It includes *Chengalikodan* and *Moongil*.

**Chengalikodan:** It is very rare but cultivated in some parts of Thrissur District of Kerala especially in Kechery and Kalparambu area. Very recently
it got the rank of Geographical indication (GI) status from the Geographical Identification Registry, Chennai (under the Geographical Identification of Goods Act 1999). Since its cultivation was restricted to the Chengazhikode village of Thrissur, it got the name as Chengalikodan.

It is similar to cv. Nendran in all aspects except the characters of fruit bunch especially in visual appeal, quality and taste. It produces much heavier bunch of 7–10 hands which bear 20–25 fruits and which weigh up to one quintal. The hands are arranged in a cyclic manner with golden yellow colored fruits. The fruits are reported to have very tasty with 26–30 percent sugar, 0.31–0.6 percent acidity and a shelf life of 7–9 days.

Normally it is planted in the month of October and has a great demand during the festival season like Onam as it is often offered as ‘Kazhchakula’ to the presiding deity at various temples including Guruvayur Sree Krishna Temple, across the state. There is no fixed rate for this banana and is determined by the visual appeal and quality.

**Moongil:** It is another ecotype of Nendran restricted to some hilly areas of Kerala. It is also very peculiar in its fruit as it produces only one or rarely two hands with 3–7 fruits; but the length of fruit may go up 50–70 cm and has a characteristic curve. It is very rare and is cultivated by the tribal peoples. Since it has a special taste, in ancient times it was used to present to Kings. Since it produces only one hand, it is also called as Ottamoongi.

*Specimens Examined:* INDIA. **Kerala:** Kozhikode Dist., Cherukulathoor (Cultivated), 12 September 2011, *Sreejith 123215* (CALI); Mundakkal (Cultivated), 03 May 2015, *Sreejith 123273* (CALI).

**Standard specimen:** INDIA. Kerala: Thiruvananthapuram Dist. (Cultivated at Malabar Botanical Garden, Olavanna), 17 May 2012, Sreejith 123226 (CALI).


**Local names:** (Kerala) Cheruvannan, Erodan, Ethappadatti, Mannan, Padathi, Thekkkan mannan, Thodan, Vannan, Vella paadan; (Karnataka) Belli baja, Cheena bale, Huli bale, Guli bale, Mara bale, Pacha bale, Kari bale, Bargi bale, Naga bale; (Tamil Nadu) Erode nadan, Kadali, Kaali, Kal kadali, Korangu laadan, Ladan, Ladda, Nadan, Nattu chingan, Pachanadan, Pachanala, Pacha vazhai; (Andhra Pradesh) Bengala, Chakkarakeli, Konda aratti, Malabar, Pacha aratti, Pacha ladan.

Plants normal; suckers 4–6, close to parent plant, 6–15 cm away, vertical. Mature pseudostem 2.6–3.2 m high, 58–65 cm circumference at base, yellowish green with maroon pigmentation, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color greenish yellow with slight maroon pigmentation, shiny; sap watery. Leaf habit intermediate; lamina 175–240 × 75–80 cm, linear-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green; lower surface dull green, waxy; leaf bases symmetric, both rounded; midrib dorsally yellowish green, glaucous; ventrally dull green with slight yellowish tinge. Petiole 45–52 cm long, waxy, more waxy towards base; petiole canal margins wide with erect, margin green with gray tinge; petiole bases with blackish brown sparse blotches along the margins, not winged and clasping the pseudostem. Inflorescence horizontal become sub-horizontal or oblique at fruit maturity; peduncle 65–74 cm long, dark green with purplish maroon pigmentation, glabrous, glaucous. Sterile bracts 2, dorsally yellowish green with maroon margins, much more in the second one, glaucous; ventrally dark
maroon with greenish yellow tinge towards margins and tip, slightly grooved with a little but not much developed green leafy appendage at the apex, deciduous. Female bud lanceolate, tip imbricate. Female bracts lanceolate, 31–39.5 × 18–20 cm, moderately grooved; abaxially maroon with greenish yellow patches, glaucous; adaxially reddish maroon with yellowish orange fading towards tip, shining; apex obtuse and sometimes split; lifting one bract at a time or rarely 2, reflexed and revolute before falling. Basal 7–8 bunches female. Female flowers 12–16 per bract in two rows, 11.7–14 cm long. Compound tepal 4–4.7 × 2–2.2 cm, creamy white with or without maroon pigmentation at base, ribbed at dorsal angles; lobes 5, yellow, outer and middle lobes slightly longer than inner and curved back. Free tepal 2.7–3 × 2.4–2.6 cm, ovoid, cup-shaped, cream, apex corrugated with a broadly pointed acumen, 0.4–0.7 cm long. Staminodes 5, 2–2.7 cm long, white with yellowish green base and grayish white tip. Ovary 7–9.2 cm long, light yellowish green; ovules in 2 regular rows per locule; style 3.8–4.3 cm long, straight, inserted, white with maroon dots or pigmentation at the middle part; stigma globose, grayish yellow, sticky. Male bud intermediate to top-shaped, imbricate at apex; rachis falling vertically, dark green with blackish brown bract scars, 57–63 cm long at fruit maturity. Male bud sometimes aborted before fruit maturity. Male bracts intermediate to top-shaped, 15.3–20 × 10.8–13.1 cm, grooved, abaxially dark purplish maroon, glaucous; adaxially reddish maroon, shiny, no sign of colour fading, apex intermediate to slightly pointed; lifting 1–2 bracts at a time, reflexed and revolute before falling; bract scars prominent. Male flowers on average 10–15 per bract in two rows, 5.3–6.5 cm long, normally fall with bract. Compound tepal 3.9–4.4 × 1.5–1.6 cm, apex curved backwards, cream with slight purplish maroon tinge, minutely ribbed at dorsal angles, lobes 5, yellow, outer and middle lobes much larger than inner, 0.5–0.8 cm long. Free tepal 2.2–2.7 × 1.5–1.8 cm, creamy white, translucent, oblong-ovate, boat-shaped; apex corrugated with prominent pointed acumen, 0.3–0.4 cm long. Stamens 5, 2.7–4.5 cm long; filament 1.3–2.5 cm long, white or creamy white; anther 1.5–2.3 cm long, mostly aborted,
rudimentary and rusty brown or if developed, cream with grayish thecae, sterile. Ovary rudiment, straight, 1.4–1.8 cm long, cream with purplish maroon pigmentation; style straight, inserted 4–4.3 cm long, white with yellow stigma. Fruit bunch lax, with 7–8 hands and 12–16 fruits per hand, in two rows; fingers pedicelled, straight or slightly curved, erect or perpendicular to the peduncle; pedicel 1.5–2 cm long, no sign of fusion at base. Fruits on mid hand 11–15 cm long, circumference 12–16 cm, slightly ridged in cross section, apex pointed or lengthily pointed, with persistent style base, immature peel colour dark green, become yellow or greenish yellow, rarely with some black markings; immature fruit pulp white, becoming cream, not much juicy but very sweet at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/Cultivation:** It is one of the commercial cultivar of Tamil Nadu especially in Coimbatore and Tiruchirappalli districts and is also cultivated in other states of South India. Even though the large size of the bunch and fruits along with the sweet taste made it popular among farmers. However, the erect nature of fruit and the shorter shelf-life become a barrier in transportation.

**Cytology:** Tripletoid (AAB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 39 – see APPENDIX II).

**Notes:** It takes around 15 months to mature from planting to harvest. It is a large plant with medium sized leaves and large bunch with big and easily falling fruits. The fruit is not so juicy but sweet and with a medium flavour. The major defect is the smaller shelf-life and so it fall off very easily.

**Specimens Examined:** INDIA. **Kerala:** Malappuram Dist., Panambra, Elampilasseri (Cultivated), 16 November 2012, *Sreejith & A. Joe 123237*; Thiruvananthapuram Dist. (Cultivated at Malabar Botanical Garden, Olavanna), 17 May 2012, *Sreejith 123237* (CALI).
**15. Musa × paradisiaca** L. (AAB) ‘Poovan’  

*Fig. 20*

**Specimens Examined:** INDIA. Kerala: Kozhikode Dist., Mundakkal (Cultivated), 13 October 2011, *Sreejith 123216* (CALI).


**Local names:** (Kerala) Cheru kai, Mysore poovan, Palayangodan; (Karnataka) Cheena bale, Huli bale, Kari bale, Kari goddi, Mysoor kadali, Nanjangud bale, Othuasa bale, Vilayathi bale, Mysoor mitli, Mitli, Mituga chandan, Terabun; (Tamil Nadu) Aduku namarai, Dorai vazhai, Erode poovan, Kadali, Kallattu vazhai, Kari vazhai, Poovan, Poovazhai, Palichan kadali, Navarai, Pulippu kai, Mysore kadali, Kotta vazhai; (Andhra Pradesh) Ginni aratti, Bengala aratti, Karpurachakkarakeli, Rasthali, Salem chakkarakeli, Sugandam, Vasana chettu, Yerra aratti, Yerra sugandam; (Maharashtra) Lalvelchi, Champa, Mysore, Sour velchi; (West Bengal) Champa, Champa kela, Alpon; (North-East) Cheni champa, Champakol, Alpon, Ladiyachampa, Garomoina, Dasaman, Kawrmut, Lang bhal-al, Bai bhal-al-their, Heijao; (Arabia) Moz sobaoel sitt; (Burma) Nget pyaw chin; (England) Mysore banana, Champa banana; (Indonesia) Pisang kelung; (Malaysia) Pisang keling; (Philippines) Inagel; (Srilanka) Hondera wale; (Thailand) Kluai khai farang, Kluai kai farang, Kluai lanka; (Vietnam) Chouicom chua.

Plants normal; suckers 3–8, close to parent plant, 6–17 cm away, vertical or slightly angled. Mature pseudostem 2.4–3.2 m high, 47–69 cm circumference at base, purplish maroon to yellowish green, with or without blackish patches, waxy, slightly glaucous towards apex, more glaucous on young plants; young plants dark maroon; underlying color yellowish green with some purplish blotches, shiny; sap watery. Leaf habit intermediate to drooping; lamina 176–230 × 68–85 cm, oblong-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green,
dull; lower surface dull green, waxy; leaf bases asymmetric, both auriculated and rounded or in some cases the auriculation is restricted to one side; midrib dorsally green with some maroon tinge; ventrally maroon or green with maroon strands, glaucous. Petiole 45–73 cm long, waxy, more waxy towards base; petiole canal margins straight with erect or sometimes slightly curved inwards, purplish maroon; petiole bases with black large blotches, sometimes extended, not winged and clasping pseudostem. Inflorescence first sub-horizontal or oblique and become pendulous at fruit maturity; peduncle 45–55 cm long, dark green with or without maroon pigmentation, slightly pubescent. Sterile bracts 2, dorsally yellowish green with maroon fading, much more in second one; ventrally maroon, highly grooved with green leafy appendage at apex, deciduous. Female bud obovate-lanceolate, tip imbricate. Female bracts obovate-lanceolate, 25–36 × 15–24 cm, highly grooved, abaxially dark maroon with or without light yellow patches, glaucous; adaxially brownish maroon, with or without yellowish patches, no sign of colour fading towards base, dull, apex obtuse and sometimes split, lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 7–15 bunches female. Female flowers 12–19 per bract in two rows, 10–12.5 cm long. Compound tepal 3.9–4.9 × 1.9–2.5 cm, creamy white with maroon fleshy patches, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner. Free tepal 2.4–3 × 2–2.6 cm, ovate-obovate, cup-shaped, translucent cream or white, apex highly corrugated with truncate and broadly pointed acumen, 0.4–0.6 cm long. Staminodes 5, 1.4–2.2 cm long, white or creamy white with light green base. Ovary 7.4–9 cm long, straight, yellowish green; ovules in two regular rows per locule; style 3.4–4.2 cm long, straight, inserted, creamy white with maroon pigmentation; stigma globose, cream or grey, sticky. Male bud lanceolate to intermediate, apex convolute or minutely imbricate; rachis falling vertically, blackish brown, 64–76 cm long at fruit maturity. Male bracts lanceolate to intermediate, 15–20.5 × 9–12.5 cm, grooved, abaxially dark blackish maroon, glaucous; adaxially reddish maroon, no sign of colour fadings towards base, shiny; apex intermediate to obtuse, not split; lifting 1–2
bracts at a time, reflexed and revolute just before falling; bract scars prominent, male bud in advanced blooming top-shaped, convolute. Male flowers on average 13–18 per bract in two rows, 5.7–6.8 cm long, fall with bract. Compound tepal 4.8–5.2 × 1.1–1.5 cm, apex curved backwards, creamy white with or without maroon patches, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.5–0.7 cm long. Free tepal 2.1–2.7 × 1.4–1.9 cm, white or creamy white, translucent or opaque, lanceolate, boat-shaped; apex slightly corrugated with or without acumen, if present, less than 0.3 cm long. Stamens 5, 3.9–4.6 cm long; filament 1.6–2.5 cm long, white or creamy white; anther 1.9–2.5 cm long, creamy white with yellowish thecae or completely cream. Ovary rudiment, straight, 1.4–1.7 cm long, creamy white with or without a purplish fading; style curved at base, inserted, 4.5–5.2 cm long, creamy white with yellow stigma. Fruit bunch very compact, with 7–15 hands and 12–19 fruits per hand, in two rows, fingers pedicelled; pedicel 1.9–2.4 cm long, fused at base. Fruits on mid hand 9–13.5 cm long, straight or straight in the distal part, circumference 9–11 cm, slightly ridged in cross section; apex bottle-necked, without any floral relicts, immature peel colour dark green, become bright yellow at maturity; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is the commonest commercial variety cultivated throughout South India. It is hardy and thrives well up to an elevation of 5000 ft. The taste and flavour vary considerably with the treatment given and the altitude where it is grown. It is actually an introduced one to South India. This factor is clear from the various local names coming the places where from it was introduced, viz. Bengala, Salem, Mysore, Palayamkodan and other names.

**Cytology:** Triploid (AAB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 35 – see APPENDIX II).
Notes: It takes around 13 months to mature from planting to harvest. It is very tall and stout with large leaves and heavy bunch of fruits. Bunches with a maximum of 350 fruits are common. It has good keeping quality and so can be exported to other states. There is a great scope for this variety to be cultivated extensively for the purpose of international trade. The fruit has a tendency to become sub-acidic when grown under irrigation and this sub-acidic taste is liked by some Indians, especially Telugus. The unripe fruits are used for culinary purpose, especially in Kerala. The fruits produced under rain-fed condition (mainly in the slopes of the Nilgiris and the Palni hills and throughout the Malabar Coast) are free from sour taste and favor to foreigners. They are good for making ‘banana figs’.

Specimens Examined: INDIA. Kerala: Kozhikode Dist., Cheruculathoor (Cultivated at CUBG), 30 January 2012, Sreejith 123222 (CALI); Thiruvananthapuram Dist. (Cultivated at Malabar Botanical Garden, Olavanna), 17 May 2012, Sreejith 123230 (CALI).

16. Musa × paradisiaca L. (AAB) ‘Rasthali’  Fig. 21


Musa sapidisiaca K.C.Jacob var. champa (Hort.) K.C.Jacob, Madras Bananas Monogr. pp. 72. 1952. syn. nov.

Local names: (Kerala) Anna poovan, Ari poovan, Nattu poovan, Nattu thuluvan, Poovan, Thuluvan; (Tamil Nadu) Karkandu vazhai, Kozhikodu, Nattu poovan, Ullur poovan, Tholluvan, Vellai tholluvan; (Andhra Pradesh) Amrithapani, Mokiri, Bengala Desi, Karpura chakkarakeli, Pallu, Pedda sugandan, Poo sugandhi, Sugantha, Thella Mokkiri; (Gujarat) Soniyal, Ambeli, Sakkal nagpur, Sakkar chayna; (Maharashtra) Mutheli, Silk fig, Apple banana; (Odisha) Patkapura, buttam, Pot kapura, Sonkel, Ellaichi, Jalakonda mokri, Kothia; (North-East & W.B.) Martman, Malbhog, Sabri, Digjowa, Amritman, Kulpait; (Burma) Htaw bat; (England) Silk banana, Apple banana,
Sugar banana, Silk fig; (France) Figue pomme; (Indonesia) Pisang rajah sereh; (Malaysia) Pisang rastali, Pisang rajah sereh; (Philippines) Latundan; (Portugal) Banana de cuba, Banana maca; (Srilanka) Kolikkud; (Thailand) Kluai nam; (Vietnam) Chuoi goong.

Plants normal; suckers 1–4, not much close to parent plant, 12–23 cm away, oblique. Mature pseudostem 1.7–2 m high, 45–63 cm circumference at base, green to yellowish green, with or without blackish patches, waxy, slightly glaucous towards apex, more glaucous on young plants, underlying color whitish green with some purplish blotches, shiny; sap watery. Leaf habit intermediate to drooping, lamina 156–240 × 42–68 cm, linear-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green, dull; lower surface dull green, waxy; leaf bases asymmetric, one rounded and one pointed; midrib dorsally dull green, ventrally dull green with slight yellowish tinge, glaucous. Petiole 45–67 cm long, waxy, more waxy towards base, petiole canal margins straight with erect or sometimes slightly curved inwards, margins green with light maroon endings; petiole bases without blotches or with sparse blackish markings at the margins, margins not winged and clasping the pseudostem. Inflorescence sub-horizontal or oblique; peduncle 47–58 cm long at fruit maturity, dull green without any pigmentation, slightly pubescent. Sterile bracts 2, dorsally dark maroon with yellowish green patches, much more in second one, ventrally dark maroon with greenish yellow patches towards base, slightly grooved without much developed green leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip imbricate. Female bracts lanceolate, 28–38 × 13–18 cm, not much grooved, abaxially dark blackish maroon with or without yellowish green patches, glaucous; adaxially reddish maroon with yellowish patches towards margins, colour fades towards base, shining; apex obtuse and sometimes split, lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 5–8 bunches female. Female flowers 5–12 per bract in two rows, 7–10 cm long. Compound tepal 4.8–5.5 × 2.3–2.7 cm, creamy white with more yellowish lobes and with or without slight pinkish striations, ribbed
at dorsal angles, lobes 5, yellow, outer lobes much longer than inner. Free tepal 3.2–3.6 × 2.1–2.7 cm, oblong-lanceolate, boat-shaped, white or creamy white, apex highly corrugated with truncate acumen 0.7–0.9 cm long. Staminodes 5, 1.3–3.2 cm long, white or creamy white with light green base. Ovary 7.3–8.3 cm long, light yellowish green, ovules in 2 regular rows per locule; style 3.5–4.6 cm long, straight, inserted, white with red dots below stigma; stigma globose, cream or greyish yellow, sticky. Male bud lanceolate, apex highly imbricate; rachis falling vertically, bare, blackish brown, 75–85 cm long at fruit maturity. Male bracts lanceolate, 18–23 × 11.5–13.5 cm, grooved, abaxially dark maroon with black patches, glaucous, adaxially reddish maroon, shiny, colour slightly fades towards extreme base, apex slightly pointed, sometimes split; lifting 1–2 bracts at a time, reflexed and revolute before falling; bract scars prominent. Male flowers on average 10–16 per bract in two rows, 7.2–8 cm long, fall with bract. Compound tepal 5.2–5.8 × 1.5–2 cm, apex curved backwards, creamy white with maroon patches, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.5–0.8 cm long. Free tepal 2.7–3.2 × 1.9–2.2 cm, white or creamy white, opaque, linear-lanceolate, boat-shaped, apex highly corrugated with prominent acumen, 0.3–0.4 cm long. Stamens 5, 4.3–5 cm long; filament 2–2.5 cm long, white or creamy white; anther 2.2–2.5 cm long, creamy white with brownish thecae or in some completely black and aborted. Ovary rudiment, straight, 2–2.3 cm long, white or creamy white without pigmentation; style straight, inserted 5–5.5 cm long, white with reddish dots just below stigma; stigma brownish yellow. Fruit bunch lax, with 5–8 hands, 5–12 fruits per hand, in two rows, fingers pedicelled; pedicel 1.3–2 cm long, fused at the base. Fruits on mid hand 9–15 cm long, straight or straight in the distal part, circumference 9–12.5 cm, rounded in cross section, apex blunt-shaped or slightly pointed, without floral relicts or sometimes with persistent style base, immature peel colour dark green, become bright yellow (without any marks) at maturity; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.
**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is the commonest commercial cultivar found in almost all states of India and also in other banana growing countries in the world such as Malaysia, Philippines, Burma, England, France, Thailand, etc. Since this plant has a very good root system, it can be grown even in places affected with stormy wind. Due to its wide range of cultivation, it has various local names.

**Cytology:** Triploid (AAB) – $2n = 3x = 33$ (Morpho-taxonomic scoring = 31 – see APPENDIX II).

**Notes:** It takes around 15–16 months to mature from planting to harvest. It has a very shining and sweet fruit and is considered as one of the most delicious of bananas throughout the world. Generally it is used as a fruit crop and the unripe fruits are also used for culinary purpose. Normally Rasthali produces medium bunch and fruit with very sweet taste but in the heavy manure condition, it produces large bunches with big fruits and may lose the natural taste and flavor.

**Specimens Examined:** INDIA. **Kerala:** Malappuram Dist., Calicut University Botanical Garden (Cultivated), 17 November 2011, Sreejith & A. Joe 116103 (CALI); *ibid.*, 22 January 2012, Sreejith 123223 (CALI). **Tamil Nadu:** Coimbatore, TNAU campus (Cultivated at NABI, Mohali, Punjab), 06 May 2013, Siddharth Tiwari 123245 (CALI).

17. *Musa × paradisiaca* L. (AAB) ‘Sirumalai’

**Standard Specimen:** INDIA. **Tamil Nadu:** Sirumalai, Puthur (Cultivated), 22 February 2014, Sreejith & A. Kabeer123262 (CALI).

Local names: (Tamil Nadu) Cheruvannan, Mala vazhai, Mala vazha pazham, Sirumalai, Sirumalai pazham, Udiran vazhai, Vannan, Vannan kali, Vella vazhai, Virupachi, Virupakshi.

Plants normal; suckers 2–4, close to parent plant, 6–15 cm away, vertical. Mature pseudostem 2.7–3.2 m high, 45–55 cm circumference at base, yellowish green with slight purple tinge, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color whitish to yellowish green with slight maroon pigmentation, shiny; sap watery. Leaf habit intermediate to drooping; lamina 210–225 × 65–70 cm, linear-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface green; lower surface dull green, highly waxy; leaf bases asymmetric, both rounded and slightly auriculated; midrib dorsally green, ventrally dull green with slight yellowish tinge, glaucous. Petiole 45–51 cm long, waxy, more waxy towards base, petiole canal margins wide with erect, with pinkish purple margins; petiole bases with black blotches, not winged and clasping pseudostem. Inflorescence horizontal; peduncle 52–62 cm long at fruit maturity, dark green with black dots, glabrous, glaucous. Sterile bracts 2, dorsally dull maroon with greenish yellow patches, much less in second one; ventrally dark purplish maroon with greenish yellow patches towards margins, not much grooved with a little but not much developed green leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip imbricate. Female bracts obovate-lanceolate, 25–35 × 15–22 cm, slightly grooved, abaxially dark blackish maroon with greenish yellow patches and yellow tip, glaucous; adaxially reddish maroon with yellow tinge towards tip, no sign of colour fading towards base, shining, apex obtuse and split, lifting 1–2 bract at a time, reflexed and revolute before falling. Basal 5–7 bunches female. Female flowers 10–14 per bract in two rows, 11–13.5 cm long. Compound tepal 4.2–5.2 × 2–2.3 cm, creamy white with maroon tinge, ribbed at dorsal angles; lobes 5, yellow, outer lobes slightly longer than inner and with a hone-like projection 0.7–1 cm long, curved back. Free tepal 2.7–3.2 × 2–2.3 cm, ovate-ovobvate, cream, apex corrugated with a pointed acumen, 0.3–0.4 cm
long. Staminodes 5, 2–3.3 cm long, white with yellowish green base and with or without purple patches at tip. Ovary 7.5–8.5 cm long, yellowish green with purplish violet pedicel, ovules in two regular rows per locule; style 3.9–4.2 cm long, straight, inserted, white or creamy white with purplish violet dots; stigma globose, grayish to cream, sticky. Male bud top-shaped, tip imbricate, almost aborted at fruit maturity but not completely; rachis falling vertically, dark green, 75–81 cm long at fruit maturity. Male bracts top-shaped, 17–20 × 12–15 cm, grooved; abaxially dark blackish maroon, glaucous, adaxially reddish maroon, shiny, no sign of colour fading, apex intermediate to obtuse, not split; lifting 2–3 bracts at a time, reflexed and revolute before falling; bract scars prominent. Male flowers on average 12–14 per bract in two rows, 5.5–7.3 cm long, fall with bract. Compound tepal 4.5–5 × 1.5–1.9 cm, apex curved backwards, cream with purplish maroon patches, ribbed at dorsal angles, lobes 5, yellow, outer and middle lobes much longer than inner, 0.5–0.7 cm long. Free tepal 2.3–2.5 × 1.7–2 cm, white or cream, translucent, ovate, apex minutely corrugated with a prominent pointed acumen, 0.2–0.3 cm long. Stamens 5, 4–5.1 cm long; filament 1.7–3 cm long, white; anther 2–2.2 cm long, cream with brownish violet thecae, sometimes anthers black and aborted. Ovary rudiment, straight, 1.7–1.9 cm long, cream with purple fleshy pigmentation; style curved at base, inserted 4.1–4.5 cm long, creamy white with dull yellow stigma. Fruit bunch lax, with 5–7 hands and 10–14 fruits per hand, in two rows; fingers pedicelled; pedicel 1.5–2 cm long, no sign of fusion at base. Fruits on mid hand 9–11 cm long, straight, perpendicular to the axis, circumference 9–10 cm, pronouncedly ridged in cross section, apex lengthily pointed without any floral relicts. Immature peel colour dark green with black dots, become yellow with green tinge and some black markings at maturity, turns dark on overripe; immature fruit pulp white, becoming cream, soft and very sweet at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.
**Distribution/ Cultivation:** It is a very rare hill banana grows only in hilly areas of Tamil Nadu at an elevation of 1000 to 5000 ft. Now the cultivation is restricted to some hill villages of Dindigul district of Tamil Nadu such as Sirumalai, Thenkadu, Thavittukadai and Velanpannai. It is cultivated along with Coffee, Pepper also as a multi-tier system. The area of cultivation is reducing year by year due to high crop loss due to frequent diseases like bunchy top and stem borer.

**Cytology:** Triploid (AAB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 43 – see APPENDIX II).

**Notes:** It is similar to the cultivar ‘Vannan’ and Jacob (1952) treated this as an ecotype under the variety vannantiana (= Vannan). It differs from Vannan with the characters of fruit like, high shelf life and also in the colour of the ripened fruits. It takes around 13–18 months to mature from planting to harvest. It is a medium to tall and stout plant with medium sized leaves and bunch with very small fruits. It is one of the hill crops in the Sirumalai regions of Tamil Nadu, thus earn the name “Sirumalai pazham”. It is growing widely in this area and is believed to have some medicinal properties and thus always priced higher than all other bananas. Even though it is unique to state of Tamil Nadu and is known for their special flavour and long shelf life. It is highly susceptible to Banana bunchy top virus (BBTV) and Stem borer, which leads to high rate of reduction of cultivation from 18000 ha to 2000 ha within a period of 7–9 years. The production of exotic hill bananas, considered superior to the native cultivars in nutrition and taste along with the difficulties in marketing our native one by the intervening of middlemen, dwindling the production. The normal market rate may go up to 5–10 rupees per fruit.
18. *Musa × paradisiaca* L. (AAB) ‘Vannan’  


*Local names:* (Kerala) Cheru vannan, Kaali, Kaalithodan, Monthan, Mundilapadan, Mundi vella paadan, Padalu, Valia thodan, Vannan, Vannan eradan, Vannan kali, Vellappadan; (Karnataka) Kaadu bale; (Tamil Nadu) Ethara vazhai, Ethana vazhai, Kaali vazhai, Katta kaali, Korangu nnaadan, Korangu pachalaadan, Kozhikkootu vazhai, Ladan, Mala vazhai, Mundi vellapaadan, Mundilapadan, Padalu, Pacha ladan, Sirumalai cheru vannan, Thenkasi mala vazhai, Udari, Valiathodan, Vannan, Vannan kaali; (Andhra Pradesh) Sugandham; (Orissa) Dacca martaban; (Ceylon) Embulhondarawala, Poo valai, Puvalu, Watupalu.

Plants tall, suckers 3–7, close to parent plant, 8–17 cm away, vertical. Mature pseudostem 2.8–3.9 m high, 51–75 cm circumference at base, yellowish green with brown patches, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color whitish green with some pinkish blotches, shiny; sap milky white. Leaf habit erect to intermediate; lamina 180–230 × 55–77 cm, oblong-lanceolate, obliquely truncate at apex, with tendril like appendage when young, upper surface dark green, lower surface dull green, waxy; leaf bases asymmetric, one rounded one pointed, midrib dorsally green, ventrally light green with or without slight pinkish pigmentation, glaucous. Petiole 45–73 cm long, waxy, more waxy towards base; petiole canal margins open with spreading, margins gray, with rare brownish black blotches, petiole bases not winged and clasping the pseudostem. Inflorescence sub-horizontal or oblique; peduncle 43–55 cm long at fruit maturity, dark green with or without black pigmentation, slightly pubescent. Sterile bracts 2, dorsally whitish green with maroon fading, much
more in the second one, ventrally maroon with green patches, highly grooved with green leafy appendage at the apex, deciduous. Female bud obovate-lanceolate, imbricate at the tip. Female bracts obovate-lanceolate, 27–35 × 19–24 cm, moderately grooved; abaxially dark maroon, glaucous; adaxially maroon, without yellow patches, no sign of colour fading, shiny, apex intermediate to obtuse, not split, lifting 1–2 bracts at a time, reflexed and revolute before falling. Basal 7–10 bunches female. Female flowers 8–15 per bract in two rows, 13–15 cm long. Compound tepal 4–4.9 × 1.9–2.2 cm, creamy white with slight maroon patches, ribbed at dorsal angles, lobes 5, yellow, outer lobes much longer than inner. Free tepal 2.4–2.8 × 1.9–2.2 cm, oblanceolate, cup-shaped, translucent white, apex highly corrugated and truncate with a broadly pointed acumen, 0.3–0.5 cm long. Staminodes 5, 2.1–2.5 cm long, white or creamy white with light green base. Ovary 8–9.5 cm long, straight or sometimes twisted, yellowish green, ovules in 2 regular rows per locule; style 4–5 cm long, straight, inserted, white with purple pigmentation; stigma globose, yellow, sticky. Male bud top-shaped to intermediate, apex slightly imbricate; rachis falling vertically, bare, blackish brown, 61–75 cm long at fruit maturity. Male bracts intermediate to obovate, 16–20 × 10–13 cm, grooved; abaxially dark maroon, glaucous; adaxially reddish maroon, shiny, colour fades towards base, apex intermediate to obtuse, not split; lifting 1–2 bracts at a time, reflexed and revolute before falling; bract scars prominent. Male flowers on average 15–18 per bract in two rows, 5.5–7.2 cm long, fall with bract. Compound tepal 4.7–5.2 × 1.1–1.5 cm, apex curved backwards, cream without any patches, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.5–0.7 cm long. Free tepal 2.5–3 × 1.8–2.1 cm, ovate, white with light yellow base, partially opaque, apex slightly corrugated with a pointed acumen; acumen 0.3–0.4 cm long,. Stamens 5, 4.5–4.9 cm long; filament 2.5–2.8 cm long, white with cream base; anther 2–2.3 cm long, creamy white with yellowish brown thecae. Ovary rudiment, straight, 1.7–2.1 cm long, creamy white with purplish fading towards tip; style straight, inserted, 4.3–4.7 cm long, creamy white
with yellow stigma. Fruit bunch compact, with 7–10 hands and 8–15 fruits per hand, in two regular rows, fingers pedicelled; pedicel 2.3–3.5 cm long, fused at base. Fruits on mid hand 12–15 cm long, straight or straight in the distal part, perpendicular to the axis, circumference 10–14 cm, pronouncedly ridged, apex bottle-necked, without any floral relics, immature peel dark green, become greenish yellow at maturity; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is found as stray cultivation in Tamil Nadu and Kerala. The taste, flavour and the keeping quality of the fruit varies with the altitude. Even though the fruits are very sweet and tasty, normally it has no commercial importance due to its short shelf life and the difficulties in the transportation due to the erect nature of fruit.

**Cytology:** Triploid (AAB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 33 – see APPENDIX II).

**Notes:** It takes around 13–14 months to mature from planting to harvest. It is a tall and stout cultivar with large leaves and medium bunch with 70–90 fruits. It has a very bad keeping quality and fall off easily. The ripened fruit is sweet and tasty and the unripe fruits are also used for culinary purpose.

**Specimens Examined:** INDIA. **Kerala:** Malappuram Dist., Calicut University Botanical Garden (Cultivated), 24 June 2011, Sreejith 123204 (CALI).

19. *Musa × paradisiaca* L. (AAB) ‘Virupakshi’ **Fig. 24**

**Standard Specimen:** INDIA. **Tamil Nadu:** Palani Hills, Pachalur (Cultivated), 24 February 2014, Sreejith & A. Kabeer123264 (CALI).

**Local names:** (Tamil Nadu) Cheru vannan, Ethara vazhai, Kaali vazhai, Kaali thodan, Kattu kali, Korangu nadan, Korangu pachaladan, Kozhikottu vazhai, Ladan, Malai kali, Malai vazhai, Mundila paadan, Mundi vellapaadan, Pachaladan, Padalu, Tenkasi malavazhai, Sirumalai, Udiran vazhai, Vannan, Vella vazhai, Valiathodan, Virupachi, Virupakshi.

Plants normal, suckers 2–4, close to parent plant, 6–18 cm away, vertical. Mature pseudostem 2.5–2.7 m high, 42–54 cm circumference at base, greenish yellow with slight purplish maroon tinge, waxy, slightly glaucous towards apex, more glaucous on young plants; underlying color greenish yellow with slight maroon pigmentation, shiny; sap watery. Leaf habit intermediate to drooping; lamina 180–190 × 55–60 cm, linear-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green; lower surface dull green, highly waxy; leaf bases symmetric, both rounded and slightly auriculated; midrib whitish dorsally green with slight yellow tinge, ventrally greenish yellow, glaucous. Petiole 47–51 cm long, waxy, more waxy towards base; petiole canal margins wide with erect, with pinkish purple margins; petiole bases with sparse blackish brown blotches, not winged and clasping pseudostem. Inflorescence horizontal, peduncle 34–45 cm long, green with slight yellow tinge and black dots at fruit maturity, glabrous, glaucous. Sterile bracts 2, dorsally dull maroon with yellowish tinge, much less in second one, ventrally maroon with slight yellow fading, not much grooved with a little but not much developed green leafy appendage at apex, deciduous. Female bud linear-lanceolate, tip imbricate. Female bracts obovate-lanceolate, 25–33 × 13–18 cm, slightly grooved, abaxially purplish maroon with greenish yellow patches, glaucous; adaxially orange red with greenish yellow tinge towards tip, no sign of colour fading towards base, shining, apex obtuse and split, lifting 1–2 bract at a time, reflexed and revolute before falling. Basal 5–9 bunches female. Female flowers 8–12 per bract in two rows, 10.4–11.7 cm long. Compound tepal 3.8–4.2 × 1.8–2.3 cm, cream with purplish maroon fleshy tinge at the base which fades towards tip, ribbed at dorsal angles; lobes 5, yellow, outer and middle
lobes slightly longer than inner, 0.5–0.8 cm long, curved back. Free tepal 2.7–2.9 × 2–2.3 cm, ovate-ovovate, cream, apex corrugated with a pointed acumen, 0.3–0.4 cm long. Staminodes 5, sub-equal, 2.2–2.6 cm long, cream with white tip and yellowish green base. Ovary 7–7.8 cm long, green with yellow fading and purplish maroon colour at pedicel, ovules in 2 regular rows per locule; style 3.8–4 cm long, straight, exserted, purplish violet; stigma globose, grayish to cream, sticky. Male bud intermediate to top-shaped, tip imbricate, almost aborted at fruit maturity but not completely; rachis falling vertically, bare, dark green, 55–65 cm long at fruit maturity. Male bracts lanceolate to intermediate, 17–20 × 11–13 cm, grooved, abaxially purplish maroon, glaucous; adaxially reddish maroon, shiny, no sign of colour fading, apex intermediate to obtuse, not split; lifting 2–3 bracts at a time, reflexed and revoluted before falling; bract scars prominent. Male flowers on average 12–14 per bract in two rows, 5.9–6.7 cm long, fall with bract. Compound tepal 4.3–4.6 × 1.4–1.7 cm, apex curved backwards, cream with purple fleshy coloration, ribbed at dorsal angles; lobes 5, yellow, outer and middle lobes much longer than the inner, 0.5–0.8 cm long. Free tepal 2.3–2.6 × 1.9–2 cm, white or cream, translucent, obovate, apex highly corrugated with a prominent tapering acumen, 0.2–0.3 cm long. Stamens 5, 3.8–4.2 cm long; filament 1.8–2.1 cm long, cream; anther 2–2.2 cm long, cream with brown thecae. Ovary rudiment, straight, 1.9–2.1 cm long, cream with purplish maroon fleshy coloration; style straight, inserted 4.1–4.4 cm long, cream with purple dots and yellow stigma. Fruit bunch lax, with 5–9 hands and 8–14 fruits per hand, in two rows; fingers pedicelled; pedicel 1.3–2 cm long. Fruits on mid hand 8–11 cm long, straight, perpendicular to axis, circumference 9–12.5 cm, pronouncedly ridged in cross section, apex lengthily pointed with persistent style base. Immature peel colour dark green with black dots, become yellow with slight green tinge and some black markings at maturity and turns dark on overripe; immature fruit pulp white, becoming cream soft and very sweet at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.
**Distribution/ Cultivation:** It is a very rare hill banana grows only in hilly areas of Tamil Nadu at an elevation of 2000 to 5000 ft. The cultivation is restricted to lower Palni, Sirumalai and Kolli hills of Tamil Nadu. Like Sirumalai, it is also cultivated along with Coffee, Pepper as a multitier system. The area of cultivation is reducing year by year due to high crop loss due to frequent diseases like bunchy top and stem borer.

**Cytology:** Triploid (AAB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 36 – see APPENDIX II)

**Notes:** It is similar to the cultivars ‘Vannan’ and ‘Sirumalai’. Jacob (1952) treated this as an ecotype under the variety vannaniana (= Vannan). It differs from Vannan in the fruit characters such as the colour of the ripe fruits yellow with a green tinge and the high shelf life of fruits. It takes around 13–18 months to mature from planting to harvest. It is a medium to tall and stout plant with medium sized leaves and bunch with very small fruits. It is one of the hill crops in the Palani regions of Tamil Nadu, and is one of the major ingredients of Panchamritham. It is growing widely in this area and due to the high natural preservative quality of the dry pulp, this prasadam can be retained for a year. Even though it is unique to state of Tamil Nadu and is known for their special flavour and long shelf life, it is highly susceptible to Banana bunchy top virus (BBTV) and Stem borer, which leads to high rate of reduction of cultivation.

In order to preserve these hill banana cultivars and also to preserve the interest of the farmers, an organization named ‘Tamil Nadu Hill Banana Growers Federation’ has been formed. The major objective is the maintenance of a disease free banana gardens and the major achievement of this federation is the obtaining Geographical Indication registration for both the Virupakshi and Sirumalai hill banana cultivars.

**Standard Specimen:** INDIA. **Tamil Nadu:** Kolli Hills, Koochakarai Paatty (Cultivated), 01 January 2014, Sreejith & A. Kabeer 123254 (CALI).

**Local names:** (Tamil Nadu) *Monthan vazai, Monthan*; (Kerala) *Mondan vazha, Mondan*; (NE) *Kachkol, Kacha kol, Kacha kela*.

Tall and robust plants with suckers 4–8, close to parent plant, 7–20 cm away, oblique. Mature pseudostem 3–3.3 m high, 48–55 cm circumference at base, yellowish green covered with grayish yellow dried sheaths, waxy, glaucous, more glaucous on young plants; underlying color light yellowish green with very light maroon pigmentation, shiny; sap watery. Leaf habit drooping; lamina 170–185 × 50–60 cm, oblong-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green, shiny; lower surface dull green, waxy, glaucous; leaf bases symmetric, both rounded and slightly auriculated; midrib dorsally green, shiny; ventrally yellowish green and glaucous. Petiole 52–58 cm long, waxy, more waxy towards base; petiole canal margins whitish green, overlapping; petiole bases not winged and clasping pseudostem, without prominent blotches. Inflorescence pendulous; peduncle long, 60–83 cm long, light green, glaucous, glabrous with long internodes. Sterile bracts 2, dorsally yellowish green with maroon fading towards margins, much more in second one; ventrally dark maroon with yellowish green tip, slightly grooved with green leafy appendage at apex, deciduous. Female bud lanceolate, tip imbricate. Female bracts intermediate to lanceolate, 26–35 × 15–21 cm, minutely grooved, abaxially maroon with greenish yellow patches towards tip, glaucous; adaxially dark reddish maroon with yellowish green patches towards tip, shining, no sign of colour fading towards base; apex obtuse and split; lifting 1–2 bracts at a time, reflexed and sometimes revolute just before falling. Basal 5–11 bunches female. Female flowers 9–13 per bract in two rows, 10–14.8 cm long. Compound tepal 4.2–5.1 × 1.9–2.7 cm, cream with pinkish maroon tinge, maroon fleshy coloration at ventral side, ribbed at
dorsal angles; lobes 5, yellow, outer lobes much longer than inner with a horn like appendage and middle one is much broader than others. Free tepal 3.1–4 × 2.2–3.4 cm, ovate-obovate, cup-shaped, partially opaque, cream with purplish maroon pigmentation, apex highly corrugated with a prominent acumen, 0.4–0.6 cm long. Staminodes 5, unequal, 2–3.6 cm long, cream with white tip. Ovary 8.3–11 cm long, straight, pale yellowish green with purplish maroon patches at tip; ovules in 4 regular rows per locule; style 3.4–3.9 cm long, straight, exserted, white or creamy white with or without purple tinge; stigma globose, grey or cream, sticky. Male bud lanceolate to top-shaped, tip highly imbricate; rachis falling vertically, bare, dark green, 53–67 cm long at fruit maturity. Male bracts obovate-oblong to intermediate, 13.6–22 × 9–15.8 cm, minutely grooved; abaxially purplish maroon, glaucous; adaxially reddish maroon with or without yellow colour at extreme tip, no sign of colour fading towards tip, shiny; apex intermediate, not split; lifting 1–2 bracts at a time, revolute just before falling; bract scars prominent; male bud in advanced blooming top-shaped, imbricate. Male flowers on average 14–20 per bract in two rows, 5.5–8.3 cm long, fall with the bract. Compound tepal 4.3–5.6 × 1.1–1.5 cm, apex curved backwards, purplish violet with cream margins, minutely ribbed; lobes 5, yellow, outer and middle lobes much longer than inner, 0.3–0.4 cm long. Free tepal 2.5–3.3 × 1.7–3 cm, obovate, opaque, purplish violet with cream base and tip, boat-shaped, apex minutely corrugated with a small acumen, 0.2–0.4 cm long. Stamens 5, 3.9–5.2 cm long; filament 1.9–2.6 cm long, creamy white with purplish maroon towards upper part; anther 2–2.7 cm long, cream with creamy white thecae. Ovary rudiment, straight, 1.6–2.7 cm long, cream with a purplish pigmentation; style straight, inserted, 4–5.3 cm long, white or creamy white with or without maroon fading and dull yellow stigma. Fruit bunch lax, with 5–11 hands and 9–13 fruits per mid hand, in two rows, fingers pedicelled, 3–4 cm long, no sign of fusion at the base. Fruits on mid hand 14–19 cm long, straight in the distal part, negatively geotropic, circumference 15.5–21 cm, pronouncedly ridged; apex blunt-tipped or rounded, with persistent floral relicts, immature.
peel colour dark green, become yellow or golden yellow with brown blotches and brownish black coloration at the tip; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is a very rare cultivar of South India, only found in stray cultivation in some parts of Tamil Nadu and in some parts of Kerala, but it is a very common cultivar in north and north-east India. It is mainly used for the culinary purposes and normally not consumed in raw form or as ripened fruit.

**Cytology:** Triploid (ABB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 64 – see APPENDIX II).

**Notes:** It takes around 14–15 months to mature from planting to harvest. The fruit is large and shows some similarity with *Nendran* but is highly peculiar with a rounded and brownish apex. The rind is very thick and is used for culinary purposes. Its name ‘Kachkol’ (Kacha = green & Kol = banana) due to its usage as green vegetables in North-Eastern states, where it is largely grown.

**Specimens Examined:** INDIA. **Arunachal Pradesh:** Chimpoo (Cultivated), 01 January 2014, **Sreejith & A. Joe 116109** (CALI); **Kerala:** Malappuram Dist., Chenakkal (Cultivated), 06 March 2013, **Sreejith & A. Joe 123239** (CALI); **Tripura:** Mohanpur (Cultivated), 01 January 2014, **Sreejith & A. Joe 116167** (CALI); **Chhattisgarh:** Bhilai (Cultivated), 01 January 2014, **Sreejith & A. Joe 130756** (CALI).


**Local names:** (Kerala) Chara Kaali, Charappadatti, Karpuravalli, Kudumbavazhai, Vellapalayankodan, Venneettu Kunnan, Vennettu Mannan, Venneettu Vannan, Venner Kunnan; (Karnataka) Banria, Baku Plata, Boothi Bale, Boothi Javari, Govakkai, Kostha Bontha, Manohar, Poombidiyan, Sakara Bale, Shahil Baig, Burkel; (Tamil Nadu) Ashy Ney Mannan, Karpura Vazhai, Karpuravalli, Kudumbavazhai, Navaral, Nellore Amrithapani, Pannai Vazhai, Peyan, Peykunnan, Poombidiyan, Rajavazhai, Samba Vazhai, Sambrani Vazhai, Thean Vazhai; (Andhra Pradesh) Batheesa Arati, Bharatha Ratnavali, Boodithi, Bukkisa Arati, Kostha Bontha, Nellore Arithapani; (Bihar) Kanthali; (Gujarat) Calanaul; (Odisha) Baku Plata; (West Bengal) Chinia; (North East) Bangla Kola Geda, Banria, Gera, Deshikadali, Manohar, Manuva Kola, Sail Kola, Shalil Kela; (Burma) Yak Hine; (England) Thai Cooking Banana, Ducgsse Banana; (Malaysia) Pisang Awak, Pisang Siem, Pisang Klotok; (Philippines) Katali; (Thailand) Kluai Nam Wa.

Plants tall and stout, suckers 3–7, close to parent plant, 6–19 cm away, vertical or slightly angled. Mature pseudostem 2.5–3.2 m high, 46–59 cm circumference at the base, yellowish green, without pigmentation, waxy, glaucous, more glaucous on young plants; underlying color light green, shiny; sap watery. Leaf habit intermediate to drooping; lamina 176–190 × 60–70 cm, oblanceolate, obliquely truncate at apex, with tendril like appendage when young, upper surface dark green, shiny, lower surface whitish green, waxy, glaucous; leaf bases asymmetric, both auriculated and rounded or in some cases the aurication is restricted to one side; midrib both sides
yellowish green, glaucous. Petiole 42–55 cm long, waxy, more waxy towards base; petiole canal margins overlapping; petiole bases without prominent blotches, not winged and clasping the pseudostem. Inflorescence pendulous; peduncle very long, 60–90 cm long at fruit maturity, light green glaucous, pubescent with long internodes, c. 27 cm. Sterile bracts 2, dorsally pink with greenish yellow fading, much more in the second one; ventrally dark maroon, highly grooved with green leafy appendage at the apex, deciduous. Female bud obovate-lanceolate, highly imbricate at the tip. Female bracts ovate-ovate, 20–28 × 14–19 cm, highly grooved; abaxially purplish maroon with greenish yellow patches, glaucous; adaxially reddish maroon, shining, no sign of colour fading towards base; apex obtuse and sometimes split, lifting 1–2 bracts at a time, reflexed and sometimes revolute just before falling. Basal 5–9 bunches female. Female flowers 10–18 per bract in two rows, 9–13 cm long. Compound tepal 3.6–4.3 × 1.7–2.3 cm, cream with pinkish maroon flesh, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner and the outermost lobes have a horn-like appendage. Free tepal 2.8–3.3 × 2.5–3 cm, ovate-ovate, cup-shaped, translucent cream or white with purplish maroon pigmentation, apex highly corrugated and truncate with a broadly pointed acumen, 0.3–0.4 cm long. Staminodes 5, 1.3–2.3 cm long, white or creamy white with light green base. Ovary 7.1–9 cm long, straight, yellowish green with purple patches at the tip, ovules in 4 regular rows per locule; style 3.3–4 cm long, straight, exserted, white or rarely creamy white without any pigmentation; stigma globose, grey or cream, sticky. Male bud lanceolate to intermediate, highly imbricate at apex; rachis falling vertically, bare, blackish brown, 60–105 cm at fruit maturity. Male bracts obovate-oblong to intermediate, 17–22.3 × 12.4–15.2 cm, not grooved; abaxially purplish maroon with yellowish green patches and yellow tip, highly glaucous; adaxially reddish maroon with yellow tip, shiny, apex obtuse, not split; lifting 1–2 bracts at a time, revolute just before falling; bract scars prominent, male bud in advanced blooming obovate, imbricate. Male flowers on average 18–20 per bract in two rows, 6.3–7.1 cm long, fall with the bract.
Compound tepal 4.5–5.4 × 1.1–1.9 cm, apex curved backwards, cream with purplish maroon pigmentation and yellow tip, slightly ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.4–0.6 cm long. Free tepal 3–3.6 × 2–2.6 cm, obovate, boat-shaped, translucent white with purplish maroon pigmentation, apex slightly corrugated with a small acumen, 0.2–0.3 cm long. Stamens 5, 4–4.7 cm long; filament 1.6–2.1 cm long, white with some maroon tinge; anther 2.2–2.9 cm long, cream with whitish thecae. Ovary rudiment, straight, 1.8–2 cm long, cream with a purplish fading; style straight, inserted, 4.3–4.8 cm long, white with creamy white or dull yellow stigma. Fruit bunch lax, with 5–9 hands and 10–18 fruits per hand in two rows; fingers pedicelled; pedicel 2.8–3.2 cm long, fused at base. Fruits on mid hand 11–14.5 cm long, negatively geotropic, straight in the distal part, circumference 13–15 cm, pronouncedly ridged, apex pointed or bottle-necked, with persistent floral relicts, immature peel colour dull green, glaucous, with or without markings, become greenish yellow with or without rusty black at maturity; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is a common cultivar in Tamil Nadu and some part of Kerala especially in the Palakkad area and also in stray cultivation.

**Cytology:** Triploid (ABB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 59 – see APPENDIX II).

**Notes:** It is a medium to very high, stout plants with heavy bunches of fruit with conspicuous ashy coating. It takes about 14 to 15 months to mature from the planting to harvest. The fruits are used both for the culinary as well as ripened fruit. It has good keeping quality and stands transport well. The plant is highly susceptible to wind and cannot be cultivated in high wind circulating areas.
National Research Centre for Banana (NRCB) develops a hybrid cultivar from *Karpuravalli* and named as ‘*Udayam*’. It is much robust in nature and which can withstand strong winds. It is also tolerant to low temperature and produces big bunches of about 18 hands and 17–18 fingers per hand, which may weigh up to 37–45 kg. It only takes about 13–14 months to mature from planting to harvest and has a greater shelf life of 12–15 days after harvest. But it also susceptible to *Fusarium* wilts.

**Specimens Examined:** INDIA. Kerala: Kozhikode Dist., Near Railway Station, 26 January 2012, *Sreejith 123221* (CALI); Tamil Nadu: Coimbatore, TNAU campus (Cultivated at NABI, Mohali, Punjab), 06 May 2013, Siddharth Tiwari 123242 (CALI); Kolli Hills, Koochakarai Paatty (Cultivated), 01 January 2014, *Sreejith & A. Kabeer123256* (CALI); Sirumalai, Tenmalai (Cultivated), 22 February 2014, *Sreejith & A. Kabeer123261* (CALI).

22. *Musa × paradisiaca* L. (ABB) ‘Kuribontha’  

**Standard Specimen:** INDIA. Andhra Pradesh: Araku, Jangarguda Village, (Cultivated), 14 January 2013, *Sreejith & A. Joe 123206* (CALI).


**Local names:** (Tamil Nadu) *Katha bontha, Pidi bontha, Pidimonthan*; (Andhra Pradesh) *Kuribontha*.

Medium sized plants with suckers 3–6, away from parent plant, 13–25 cm away, slightly angled. Mature pseudostem 2–3.2 m high, 44–53 cm circumference at base, yellowish green, without pigmentation, waxy, glaucous, more glaucous on young plants, underlying color light green, shiny; sap watery. Leaf habit intermediate to drooping; lamina 172–190 × 60–72 cm, oblong-lanceolate, obliquely truncate at apex, with tendril like appendage when young, upper surface dark green, shiny, lower surface dull green, waxy,
glaucous; leaf bases symmetric, both auriculated and rounded; midrib both sides greenish yellow with slight pink coloration, ventrally glaucous. Petiole 44–60 cm long, waxy, more waxy towards base; petiole canal margins pink purple, overlapping; petiole bases not winged and clasping pseudostem, no prominent blotches. Inflorescence sub-horizontal or oblique, peduncle very short, 34–50 cm long, dark green glaucous, glabrous with short internodes. Sterile bracts 2, dorsally pink with greenish yellow fading, much more in second one, ventrally dark maroon, highly grooved with green leafy appendage at apex, deciduous. Female bud obovate-lanceolate, tip highly imbricate. Female bracts obovate-lanceolate, 24–27 × 15–17 cm, moderately grooved, abaxially purplish maroon with greenish yellow patches towards tip, glaucous; adaxially dark reddish maroon with yellowish green tip, shining, no sign of colour fading towards base, apex obtuse and split; lifting 1–2 bracts at a time, reflexed and sometimes revolute just before falling. Basal 4–8 bunches female. Female flowers 6–12 per bract in two rows, 9.5–12 cm long. Compound tepal 3.5–3.7 × 2.2–2.5 cm, cream with pinkish maroon fleshy coloration at inner side, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner. Free tepal 3.1–3.3 × 2.8–3 cm, ovate-obovate, cup-shaped, partially opaque, cream or white with purplish maroon pigmentation, apex highly corrugated with a broad acumen, 0.2–0.3 cm long. Staminodes 5, unequal, 1.5–2.3 cm long, white with light green base. Ovary 7.5–8.4 cm long, straight, pale yellowish green with purplish maroon patches at pedicel and tip; ovules in 4 regular rows per locule; style 3.2–3.5 cm long, straight, exserted, white without any pigmentation; stigma globose, grey or cream, sticky. Male bud intermediate to top-shaped, tip highly imbricate; rachis falling vertically, bare, blackish brown, 55–65 cm long at fruit maturity. Male bracts obovate-oblong to intermediate, 16.3–17.5 × 11.4–12.2 cm, moderately grooved; abaxially dark brownish maroon without pigmentation, highly glaucous; adaxially reddish maroon with yellow colour at extreme tip, shiny, no sign of colour fadings towards base; apex obtuse, not split; lifting 1–2 bracts at a time, revolute just before falling; bract scars prominent; male bud
in advanced blooming top-shaped, imbricate. Male flowers on average 16–18 per bract in two rows, 5.7–6.3 cm long, fall with bract. Compound tepal 4.2–4.6 × 1.1–1.3 cm, apex curved backwards, purplish violet with cream margins, not ribbed; lobes 5, yellow, outer and middle lobes much longer than inner, 0.3–0.4 cm long. Free tepal 2–2.3 × 1.8–2 cm, oblong-ovate, opaque, purplish violet with cream base and tip, boat-shaped, apex minutely corrugated with a broadly truncate acumen, 0.2–0.4 cm long. Stamens 5, 4–4.4 cm long; filament 1.8–2.1 cm long, cream with purplish maroon towards tip; anther 1.8–2.2 cm long, cream with creamy white thecae. Ovary rudiment, straight, 1.5–1.8 cm long, cream with purplish violet pigmentation; style straight, inserted, 4–4.3 cm long, white with creamy white or dull yellow stigma. Fruit bunch lax, with 5–8 hands and 10–12 fruits per mid hand, in two rows, fingers pedicelled; pedicel 2.3–3.2 cm long. Fruits on mid hand 8–14 cm long, straight, negatively geotropic, circumference 12–14 cm, pronouncedly ridged, apex pointed, with persistent floral relicts, immature peel colour dark green, become yellow with brownish red lines on ripening; immature fruit pulp white, remains white and become soft even ripening. Seeds completely absent.

Flowering & Fruiting: Throughout the year.

Distribution/ Cultivation: It is a very rare cultivar only found in stray cultivation in some parts of Andhra and Tamil Nadu and is not grown as pure stand anywhere. The unripe fruits are used mainly for culinary purpose and the ripe fruits may occasionally be consumed in the places where they are grown.

Cytology: Triploid (ABB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 64 – see APPENDIX II).

Notes: It takes around 15–16 months to mature from planting to harvest. It shows some similarity with ‘Monthan’ but differs in the small size of fruit and much lax nature of hands. Since it is highly attached to the pedicel even after
ripening it can be transported easily. The fruit peel/ rind is very thick and is also used for culinary purposes.

23. *Musa x paradisiaca* L. (ABB) ‘Monthan’  

**Standard Specimen:** INDIA. Kerala: Thiruvananthapuram Dist. (Cultivated), 17 May 2011, Sreejith 123224 (CALI).


**Local names:** (Kerala) Chetti kai, Erachi vazha, Kuppakaali, Malavannan, Ponnan, Ponthan, Sodari, Thenali, Thezhuthani; (Karnataka) Akku bale, Aunda bale, Banga bale, Budhu bale, Deva bale, Kalyana bale, Kari bale, Kilandi, Konga bale, Manga bale, Mara bale, Mathuranga bale, Shan bale, Silanti; (Tamil Nadu) Erode bonthan, Erode monthan, Erode vazhai, Kondai monthan, Kondaikai, Maanaathu monthan, Malai monthan, Monthan vazhai, Naathangi monthan, Nattu monthan, Nielh bontha, Nirbontha, Thoppul vazhai, Yendra monthan, Yenthala monthan, Trichirapalli monthan, Trichynopoly monthan; (Andhra Pradesh) Basthi bontha, Muchika bontha, Yenugu bontha, Yenugu monthan; (Maharashtra & Odisha) Bainsa, Bankel, Bankela, Bhaingu, Bainsa kela, Kachkela, Kanchikela; (North East) Dakshinsagar, Kachkel, Kashkel, Sahjikela, There haw; (Malaysia) Pisang nangka; (Philippines) Madhuranga; (Thailand) Kluai Nom Mi; (Vietnam) Chuoi Ngop Cau.

Plants normal; suckers 3–7, not much close to parent plant, 12–21 cm away, vertical or slightly angled. Mature pseudostem 2.5–3.1 m high, 46–55 cm circumference at base; yellowish green, without pigmentation, waxy, glaucous, more glaucous on young plants; underlying color light green, shiny; sap watery. Leaf habit intermediate to drooping; lamina 176–190 × 60–70 cm, oblong-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green, shiny; lower surface whitish green, waxy, glaucous; leaf bases asymmetric, both auriculated and rounded or in
some cases auriculation is restricted to one side; midrib both sides yellowish green, glaucous. Petiole 42–55 cm long, waxy, more waxy towards base; petiole canal margins grayish, overlapping; petiole bases without prominent blotches, not winged and clasping the pseudostem. Inflorescence pendulous; peduncle long, 65–75 cm long at fruit maturity, light green glaucous, pubescent with long internodes, c. 27 cm long. Sterile bracts 2, dorsally pink with greenish yellow fading, much more in second one; ventrally dark maroon, highly grooved with green leafy appendage at apex, deciduous. Female bud obovate-lanceolate, tip highly imbricate. Female bracts ovate-ovobvate, 20–28 × 14–19 cm, highly grooved, abaxially purplish maroon with greenish yellow patches, glaucous; adaxially reddish maroon, shining, no sign of colour fading towards base, apex obtuse and sometimes split; lifting 1–2 bracts at a time, reflexed and sometimes revolute just before falling. Basal 5–9 bunches female. Female flowers 10–16 per bract in two rows, 9–13 cm long. Compound tepal 3.6–4.3 × 1.7–2.3 cm, cream with pinkish maroon flesh, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner and outermost lobes have a horn-like appendage. Free tepal 2.8–3.3 × 2.5–3 cm, ovate-ovobvate, cup-shaped, translucent cream or white with purplish maroon pigmentation, apex highly corrugated and truncate with a broadly pointed acumen, 0.3–0.4 cm long. Staminodes 5, 1.3–2.3 cm long, white or creamy white with light green base. Ovary 7.1–9 cm long, straight, yellowish green with purple patches at tip, ovules in 4 regular rows per locule; style 3.3–4 cm long, straight, exserted, white or rarely creamy white without any pigmentation; stigma globose, grey or cream, sticky. Male bud lanceolate to intermediate, tip highly imbricate; rachis falling vertically, bare, blackish brown, 50–60 cm long at fruit maturity. Male bracts obovate-oblong to intermediate, 17–22.3 × 12.4–15.2 cm, not grooved, abaxially purplish maroon with yellowish greenish yellow tip, highly glaucous; adaxially reddish maroon with yellow tip, shiny, no sign of colour fadeings towards base, apex obtuse, not split; lifting 1–2 bracts at a time, revolute just before falling; bract scars prominent; male bud in advanced blooming obovate, imbricate. Male
flowers on average 18–20 per bract in two rows, 6.3–7.1 cm long, fall with the bract. Compound tepal 4.5–5.4 × 1.1–1.9 cm, apex curved backwards, cream with purplish maroon pigmentation and yellow tip, slightly ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner, 0.4–0.6 cm long. Free tepal 3–3.6 × 2–2.6 cm, obovate, translucent white with purplish maroon pigmentation, boat-shaped, apex moderately corrugated with a broadly truncate acumen, 0.2–0.3 cm long. Stamens 5, 4–4.7 cm long; filament 1.6–2.1 cm long, white with some maroon tinge; anther 2.2–2.9 cm long, cream with whitish thecae. Ovary rudiment, straight, 1.8–2 cm long, cream with purplish fading; style straight, inserted, 4.3–4.8 cm long, white with creamy white or dull yellow stigma. Fruit bunch lax, with 5–9 hands and 10–16 fruits per hand, in two rows; fingers pedicelled, 2.8–3.2 cm long, no sign of fusion at base. Fruits on mid hand 11–14.5 cm long, straight, circumference 13–15 cm, pronouncedly ridged, negatively geotropic; apex pointed, with persistent floral relicts, immature peel colour dull green with or without markings, become greenish yellow with or without rusty black markings at maturity; immature fruit pulp white, becoming creamy white and soft at maturity. Seeds completely absent.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is a common cultivar growing in almost all states in South India. Since it is widely used for the culinary purposes, it has a great demand in the vegetable market and there is a large trade in the unripe fruit.

**Cytology:** Triploid (ABB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 64 – see APPENDIX II).

**Notes:** It takes around 13–14 months to mature from planting to harvest. It is fairly a tall and stout variety with a medium size bunch of around 50–70 fruits per bunch. There is a great trade in the vegetable market. The unripe fruit is widely used to prepare ‘bhagi’, chips and also for other culinary usages. The ripened fruits are also consumed rarely.
Specimens Examined: INDIA. Kerala: Thrissur, Parappur, Keeripalam (Cultivated), 14 February 2011, Alfred Joe 123206 (CALI); Tamil Nadu: Dindigul Dist., Authupatty, 165 m. (Cultivated), 23 February 2014, Sreejith & A. Kabeer 123263 (CALI).


Local names: (Kerala) Ney vannan, Ney vazha, Peyan; (Tamil Nadu) Kallu vazhai, Kotta vazhai, Madavazhai, Peyan, Savargundy; (Andhra Pradesh) Booditha aratti, Nokala bontha, Palakola bontha, Sapota bontha, Rasthali.

Plants tall, stout; suckers 4–9, very close to parent plant, 4–18 cm away, vertical. Mature pseudostem 3.5–4.1 m high, 57–72 cm circumference at base, yellowish green with maroon pigmentation covered with grayish white old sheath, waxy, glaucous, more glaucous on young plants; underlying color whitish green, shiny; sap watery. Leaf habit drooping; lamina 206–220 × 60–67 cm, oblong-lanceolate, obliquely truncate at apex, with tendril like appendage when young; upper surface dark green, shiny; lower surface whitish green, waxy, glaucous; leaf bases asymmetric, both auriculated and rounded; midrib both sides yellowish green, glaucous. Petiole 64–70 cm long, waxy, more waxy towards base; petiole canal margins gray, overlapping; petiole bases with sparse black blotches, not winged and clasping pseudostem. Inflorescence pendulous; peduncle long, 65–90 cm long, light green glaucous, glabrous with long internodes, 22–43 cm long. Sterile bracts 2, dorsally greenish yellow with maroon fading, much more in second one; ventrally dark maroon, highly grooved with green leafy appendage at apex, deciduous. Female bud obovate-lanceolate, tip highly imbricate. Female bracts
intermediate to ovate-obovate, 28–32 × 19–20 cm, slightly grooved; abaxially purplish maroon with greenish yellow patches, glaucous; adaxially reddish maroon, shining, no sign of colour fading towards base, apex obtuse and split; lifting 1–2 bracts at a time, reflexed, sometimes revolute just before falling. Basal 7–10 bunches female. Female flowers on mid-hand 12–16 per bract in two rows, 11.4–13.5 cm long. Compound tepal 3.9–4.3 × 1.8–2.1 cm, cream with pinkish maroon flesh, ribbed at dorsal angles; lobes 5, yellow, outer lobes much longer than inner and the outermost lobes have a horn-like appendage. Free tepal 3–3.3 × 2.5–2.7 cm, obovate-lanceolate, boat-shaped, translucent white without pigmentation, apex highly corrugated with truncate and broadly pointed acumen, 0.3–0.4 cm long. Staminodes 5, 1.3–1.6 cm long, white with light green base. Ovary 7.7–8.5 cm long, straight, yellowish green with purple patches at tip, ovules in 4 regular rows per locule; style 3.9–4.1 cm long, straight, inserted, white without any pigmentation; stigma globose, grey or cream, sticky. Male bud intermediate to top-shaped, tip imbricate, sometimes aborted at fruit maturity; rachis falling vertically, bare, green with blackish brown tinge, 65–105 cm long at fruit maturity. Male bracts intermediate, 20–23.5 × 12–13.5 cm, not grooved; abaxially purplish maroon with yellowish green margins and yellow tip, highly glaucous; adaxially reddish maroon with yellow tip, shiny, no sign of colour fading towards base, apex obtuse, not split; lifting 1–2 bracts at a time, revolute just before falling; bract scars prominent; male bud in advanced blooming top-shaped, imbricate. Male flowers on average 18–22 per bract in two rows, 7–7.5 cm long, predominantly cream, fall with the bract. Compound tepal 4.9–5.2 × 1.2–1.4 cm, apex curved backwards, cream with slight purplish maroon pigmentation and yellow tip, ribbed at dorsal angles; lobes 5, yellow, outer and middle lobes much longer than inner, 0.4–0.6 cm long, outermost lobes with a horn-like appendage. Free tepal 2.4–2.7 × 1.5–1.7 cm, translucent white without pigmentation, oblanceolate, boat-shaped, apex highly corrugated with a small, narrow, pointed acumen, 0.1–0.2 cm long. Stamens 5, 3.7–4 cm long; filament 1.6–1.7 cm long, cream; anther 2.1–2.3 cm long,
creamy yellow with white or creamy white thecae. Ovary rudiment, straight, 2–2.2 cm long, cream without pigmentation; style curved at base, inserted, 5–5.5 cm long, white with dull yellow stigma. Fruit bunch lax, with 7–10 hands and 12–16 fruits per hand, in two rows; fingers pedicelled, 2.3–2.5 cm long, fused at base. Fruits on mid hand 9–11 cm long, straight, negatively geotropic, circumference 9–12 cm, slightly ridged; apex bottle-necked, with persistent style base; immature peel colour dull green, become dull yellow with glaucous on ripening; immature fruit pulp white, becoming cream and soft at maturity. Seeds completely absent or in some cases when planted along with wild species may produce 3–8 seeds at the fruit tip; seeds black, bilaterally flattened, warty.

**Flowering & Fruiting:** Throughout the year.

**Distribution/ Cultivation:** It is not much common, but cultivated in the backyards of some houses especially in Tamil Nadu and some areas of Kerala especially in Thiruvananthapuram.

**Cytology:** Triploid (ABB) – 2n = 3x = 33 (Morpho-taxonomic scoring = 63 – see APPENDIX II).

**Notes:** It takes about 14–15 months to mature from the time of planting to harvest. Plant is very tall, stout and produces large leaves. It produces numerous suckers up to 4–9 and can easily spread. Fruits are very small, angled, pointed upwards and are very closely arranged in the hand but the hands are much lax in the long bunch. The fruit is reported to have laxative properties.

**Specimens Examined:** INDIA. Kerala: Thiruvananthapuram Dist. (Cultivated at Malabar Botanical Garden, Olavanna), 17 May 2012, Sreejith 123224 (CALI).