BANANA Less Exploited Landraces in India

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Protection of Plant Varieties and Farmers' Rights Authority
New Delhi

National Research Centre for Banana (ICAR)

Thogamalai Road, Thayanur Post, Tiruchirapalli - 620 102, Tamil Nadu, India.

Published by

Director

National Research Centre for Banana (ICAR)

Thogamalai Road Thayanur Post Thiruchirapalli - 620 102

Editors

S. Uma, M.S. Saraswathi, S. Backiyarani, P. Durai and M.M. Mustaffa 2014. "Banana - Less Exploited Landraces in India" - National Research Centre for Banana (ICAR), Thogamalai Road, Thayanur Post, Thiruchirapalli - 620 102.

Cover Design and Photo Credit: S. Uma, K.P. Sajith and P. Durai

Printed at

Prdag Print

392 A, 6th Street

Gandhipuram

Coimbatore - 641 012.

Phone: 0422 3059034

E-mail: prdagprint@gmail.com

प्रो० आर. आर. हॅचिनाल अध्यक्ष पौधा किस्म और कृषक अधिकार संरक्षण प्राधिकरण, भारत सरकार एन.ए.एस.सी. काम्प्लैक्स, डीपीएस मार्ग, नई दिल्ली-110012



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Foreword

Banana is one of the earliest crops domesticated by man and this has led to the evolution of few hundreds of varieties which are under cultivation. However, only 20 - 30 varieties have gained commercial importance and currently the banana trade is dominated by Grand Naine, one of the most popular Cavendish clones (AAA). This is mainly because of its amenability to tissue culture, hi-tech cultivation practices like high density planting, fertigation etc. This has led to the enhanced production and productivity. But in some southern parts of India, polyclonal system of cultivation is still in vogue with varied seasons of cultivation ultimately leading to the year around availability of one or the other varieties of banana. These less exploited landraces are known to be rich in nutrients and possess therapeutic values. Despite their cultivation, commercialization and sustenance, they are being threatened by a number of biotic and abiotic stresses. The menace of pests and discases is further aggravated by the perennial system of cultivation of many of the landraces with limited resources.

India is a pioneer country in the world that effectively enacted a "sui generis" plant variety protection and farmers' rights system in 2001. Plant breeders in public and private sector in India have introduced several new varieties in crops that have increased productivity and farm income considerably. Protection of Plant Varieties & Farmers' Rights Act, 2001 provides for legal protection of varieties of crop plants of economic importance and it is expected that the revenue earned through commercial exploitation of these varieties will be ploughed back to strengthen the research & development system.

Under IPR regime, it is essential to safeguard the genetic wealth of India through proper documentation. Local custodians will also be benefitted by

commercial exploitation of these landraces for their special attributes like fragrance, therapeutic, ornamental values etc. through benefit sharing which is very much in place in India. Hence systematic identification, collection, conservation, characterization and their documentation become priority activities.

In this document 'Banana - Less Exploited Landraces in India' authors have made an appreciable effort to document the distribution, description, ethnobotanical values, possible utilities of different landraces spread in various agro-ecologies of the country. This document also highlights the ethnic groups involved in conserving these valuable landraces. The production constraints for each landrace and their possible utility either directly or in the banana improvement programs are also listed in detail. This document would be valuable not only for banana researchers and farming community as a whole but also in identifying the important varieties of banana for seeking registration under Protection of Plant Varieties and Farmers' Rights Act 2001.

(R.R. Hanchinal)

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Foreword

It is widely known that banana has originated and diversified in the North Eastern regions and also parts of Western Ghats in South India. Bananas are grown for local consumption as dessert and also for cooking in the tropical regions in India. Even though India is having vast diversity for banana and plantains, only few are cultivated commercially in many states of India and banana trade is dominated by one to two cultivars especially Cavendish type. In addition, some 15-20 cultivars are grown based upon the location and consumer preferences. Inspite of those traditional cultivars, India is bestowed with numerous less known landraces which can be fully exploited for their unique characters like colour and flavor and also for nutraceutical values. The less known landraces are facing the threat of extinction due to the urbanization, change in the land - utility pattern and genetic erosion at the centers of diversity. These landraces need to be conserved for posterity for their uniqueness and also for conserving diversity in banana. There is a need to do systematic surveys, documentation and creation of database which will provide information for future use in utilization of these germplasm in breeding and for their niche quality. Unfortunately, only limited efforts have been made to collect the information on these less known landraces and utilize them for future needs.

In this book, the authors have collected the information on banana landraces which are present mostly in south India and also in North Eastern regions. The authors have made an attempt to collect various information on these less known landraces available in India and documented based on agroecological locations. I am sure, this book will be useful to the banana researchers, farming community, policy makers and students who are directly involved with banana.

(N.K. Krishna Kumar)

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Introduction

Banana cultivation dating back to 120 B.C, with the existence of dwarf statured bananas and bananas with reddish sap has been quoted in Tamil literature which is a prelude for its existence since time immemorial. Further is quite evident from its mention in the epics like Ramayana (2020 B.C.), Kautilya's Arthasastra (300-400 B.C.) and its presence in paintings and sculptures of Ajantha and Ellora (600 B.C.) caves of Maharashtra.

Bananas are inseparable from our heritage and culture and therefore have been accepted as the symbol of prosperity and fertility and nurtured within the sacred precincts. In addition, they have great socio-economic significance owing to its multifaceted uses for the benefit of mankind and thus rightly referred to as 'Kalpatharu' (a plant of all virtues).

For most of the developed economies, bananas represent only dessert fruits while in India and other parts of the world where bananas have originated, it comprises of a large group of fruits with diverse utilities starting from a popular common fruit with nutritive and therapeutic values, popular vegetable (not only the fruits but other parts like, pseudostem sheath, inner core, flower buds etc.), to a staple food and commercial applications like in fibre and floriculture industry.

Bananas are grown in more than 150 countries over an area of 5.14 million ha contributing to the production of 105.32 million tonnes. India has been the largest producer of bananas with an annual production of 28.45 million tonnes from an area of 0.8 million ha and accounts for nearly 26.6 percent of the global production (FAO, 2012).

India, being one of the places of origin, antiquity and long history of domestication, has been endowed with a great diversity for dessert and other bananas with varied genomic status namely AA, AAA, AB, AAB, ABB and BB. The rich genetic diversity is an irreplaceable resource, providing materials for introduction, domestication and improvement programmes as well as opportunities for the search and selection of *Musa* genotypes resistant to pests and diseases.

There are about hundred named cultivars and landraces in India which are being cultivated across the country in conventional banana growing regions. Although the invasion of Grand Naine has revolutionized the banana industry

in India, it has inadvertently led to the slow decline of area under many indigenous landraces. Despite their cultivation, commercialization and sustenance of landraces in the ecosystem, they are being threatened by a number of biotic and abiotic stresses. They include fungal diseases like, Fusarium wilt (Fusarium oxysporum f.sp. cubense) and leaf spot diseases (Mycosphaerella spp.), viral diseases like Banana Bunchy Top, Banana Bract Mosaic, Banana Streak, Cucumber Mosaic, Mild Mosaic and others. The pests include weevils and borers, aphids, nematodes etc. The menace of pests and diseases is further aggravated by the perennial system of cultivation of many of the landraces with limited resources.

The indigenous knowledge on *Musa* landraces is a treasure, on which very little information has been documented. The decline in the number and area under landraces is so alarming that they may face extinction even before their systematic identification, collection, conservation, documentation and let alone its commercial exploitation. Sterility, polyploidy and clonal propagation have led to the narrow genetic base in banana thus making them vulnerable to large number of pests and diseases. This could also be attributed for their limited success in improvement through conventional breeding. The banana landraces along with their wild relatives are a store house of many resistant genes for biotic and abiotic stresses. These parthenocarpic landraces also have the ability to set seeds under controlled conditions and the hybrids of which can be used directly for commercial utilization or as a base material (synthetic/improved diploids) for use in breeding programs. The distribution, description, ethnobotanical values, possible utilities of the lesser exploited landraces are detailed in this book.

MATTI



Synonyms

Genome AA

Sub group

Distribution Southern parts of Tamil Nadu and

Kerala (commonly maintained in the backyards by Kothaiyar tribes around Kothaiyar and Pechipparai dam in southern tips of Tamil Nadu)

Description

Stature Medium (8-10 ft), yellowish green

pseudostem with dark purple

blotches on the petiole base

Leaves Erect and light green in color

Bunch Slightly angular, very compact,

closely packed hands and fingers

Yield 12-13 kgs with a potential of 15 kgs

Fruit Curved, lengthily pointed tip, light

green at maturity and pale yellow upon ripening. 40-60 g fruit with a

thin skin

Pulp Juicy, very sweet with a pleasant

aroma

Duration 11-12 months

Utility Dessert

Special uses Used as infant food, having therapeutic

values

Used in gene pyramiding programmes

Problems Susceptible to Cordona leaf spot

disease

Special features Resistant to Fusarium wilt (race 1)

disease

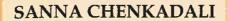
Plants can be used in breeding programme both as male and female parent, fruits are resistant to

shattering at ripeness

















	NAMARAI
Name	Namarai
Synonyms	
Genome	AA
Sub group	
Distribution	Southern parts of Tamil Nadu and Kerala. (commonly maintained in the backyards by Kothaiyar tribes around Kothaiyar and Pechipparai damin southern tips of Tamil Nadu)
Description	
Stature	Small and slender with a maximum height of 5.0-6.0 ft
Leaves	Erect and light green
Bunch	Small, slightly angular, 4-5 hands, loosely packed
Yield	3-4 kgs with a maximum of 5 kgs
Fruit	10-12 fruits per hand, small in size, dull yellow upon ripening. 7-8 cm in length
Pulp	Juicy, slightly acidic with good aroma and taste
Duration	9-10 months
Utility	Dessert
Special uses	Plants exhibit short duration, suitable for perennial system of cultivation, maintained as mats for regular supply of bunches. Suitable for marginal and water deficit environments. Also used in banana breeding programmes for development of synthetic diploids with short duration
Special features	Short duration No report of Fusarium wilt incidence
	1 of teport of rusarium with includence

in the field

Problems

Susceptible to leaf spot diseases.

(Mycosphaerella eumusae)

Sanna Chenkadali Name Semmatti, Cheriya, Chenkadali **Synonyms** AA Genome Sub group Distribution Maintained as backyard crop in villages around Nagarkoil and Kanyakumari areas of Tamil Nadu Description Slender, pseudostem is light Stature reddish with dark blotches below the petiole base Medium, narrow, green and slightly Leaves pink on lower side of the leaf Slightly angular, very compact, Bunch closely arranged hands 10-12 kgs with a potential of 15 kgs Yield Red colored and very attractive with Fruit a pointed tip Juicy, slightly acidic in taste, soft in Pulp texture and with good aroma Utility Dessert Special uses Fruits are considered to have therapeutic values and rich in carotenoids. Used in breeding programme, to induce tolerance to leaf spot diseases (Mycosphaerella eumusae), Red skin color and

resistance to fruit shattering







KADALI





Synonyms Neyvediya Kadali, Ney Kadali,

Devan Kadali, Surya Kadali

Genome AA

Sub group

Distribution Southern parts of Tamil Nadu and

Kerala

Revered as sacred fruit, this variety is mainly nurtured in sacred grooves

and village temples

Description

Stature Medium, yellowish green

pseudostem

Leaves Erect

Bunch Small with 5-6 loosely packed hands

Yield 4-5 kgs with a potential of 10 kgs

Fruit Tapering tip, persistent and

predominant style, green at maturity

and yellow upon ripening

Pulp Cream colored, sweet and highly

aromatic

Duration 9-11 months

Utility Dessert

Special uses Considered sacred and offered

specially in temples to Lord Ayyappan. Also used for the preparation of Panchamritham (a sacred concoction of 5 ingredients namely honey, jaggery, dates, sugar

candy and raisins)

Problems Fruits fall off at full maturity

ANAIKOMBAN

Name Anaikomban

Synonyms Attukomban

Genome AA

Sub group

Distribution Tamil Nadu, Kerala

Description

Stature Pale green, wax coated petiole

margins outwardly curved and

shaded by very attractive pink

Leaves Erect, green

Bunch Medium 6-8 hands, loosely packed

Yield 8-10 kgs with a maximum of 15 kgs

Fruit Long , straight, greenish at maturity

and greenish yellow upon ripening

Pulp Juicy, sweet with slightly acidic taste

Duraion 10-11 months

Utility Dessert

Special uses Utilized in banana breeding

programmes for nematode resistance (*Pratylenchus coffeae*) and better fruit

quality

Special features Resistant to nematode (*Pratylenchus*

coffeae) and suitable for cultivation at

 $higher\, altitudes$

No incidence of Fusarium wilt (race 1 and 2). Exhibits high female fertility with good seed set and hence could be used as female parent in banana

breeding programme

Problems Susceptible to Sigatoka leaf spot

diseases





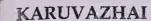




















Problems

Name	Kanai Bansi
Synonyms	Hatidat, Mohan Bansi, Hathi Kela
Genome	AA
Sub group	
Distribution	North eastern India, Orissa, West Bengal
Description	
Stature	Medium
Leaves	Green, erect
Bunch	Medium, 6-7 loosely packed hands
Yield	9-10 kgs with a potential of 15 kgs
Fruit	Very long, straight without any curvature, 20 - 21cm, smooth with blunt tip, green at maturity and greenish yellow upon ripening
Pulp	Juicy, cream colored, sweet with acidic taste
Duration	11-12 months
Utility	Dessert
Special uses	Used in breeding programmes to improve fruit quality
	Because of its cold tolerance, it is being grown in higher altitudes of North Eastern India
	Also has potential for cultivation in

Also has potential for cultivation in high altitudes of southern India. Susceptible to Sigatoka leaf spot diseases

Karuvazhai Name

Kari Vazhai, Pacha, Manoranjitham **Synonyms**

AAA Genome

Sub group

Distribution Endemic to Kolli Hills of Namakkal district of Tamil Nadu, nurtured by

Malyali tribes, in the sacred grooves

Description

Medium, dark green pseudostem Stature

with black blotches

Normal, dark green Leaves

Pendulous, 5-7 hands, loosely packed Bunch

8-10 kgs with a potential of 12-15 kgs Yield

Bold, 13 - 15 cm length with 10 cm Fruit

> circumference, dark green, blunt tip, pale green upon ripening, with a thin

fruitskin

Juicy, sweet with intense aroma, the Pulp

> flavor is comparable with the fragrance of Manoranjitham (Artabotrys odoratissimus) flower.

Skin is more fragrant than pulp

Duration 11-12 months

Utility Dessert

Special uses Considered highly sacred and hence

offered to the goddess "Kongai Amman" at Kolli Hills and in all other social occasions like marriage,

festivals etc.,

Special features Immune to leaf spot diseases, female

fertile, highly fragrant

Highly susceptible to Fusarium wilt **Problems**

(race 1), corm weevil and

pseudostem borer









AMRITSAGAR

BHARATH MONI



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Amritsagar Name

Mizo Cavendish

good aroma

11-12 months Duration

Utility Dessert

> Because of its fragrance and excellent fruit quality, it has been elevated from backyard crop to commercial variety in Mizoram. It is slowly becoming popular in other

states.

Susceptible to Sigatoka leaf spot **Problems**

diseases and scarring beetle

Bharath Moni Name

Thella Chakkarakeli, Rajavazhai, Synonyms

Thenvazhai

AAA Genome

Sub group

Distribution Tamil Nadu, Kerala, Andhra

Pradesh, West Bengal and North

Eastern India

Description

Medium, growing upto a height of Stature

> 2.0-2.3 m, pseudostem is watery green and the petiole margins are

outwardly curling

Green in color and erect Leaves

6-8 hands loosely packed, angular in Bunch

position

Yield 10-11 kgs

Watery green at maturity, change Fruit

into pale yellow upon ripening, Fruit

peel is thick

Unique taste, orange yellow in Pulp

colour, sweet pulp with excellent

aroma

Duration 11-12 months

Utility Dessert

Special uses Since it has a thick peel and the pulp

is juicy, the fruits are just crushed

with hand and sipped off

Orange yellow pulp is rich in carotenoids (Pro Vitamin - A)

Fruits do not shatter at full ripeness

Susceptible to Fusarium (race 1) wilt **Problems**

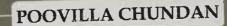
and Sigatoka leaf spot diseases



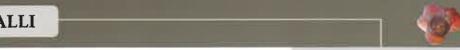














Name Poovilla Chundan

Synonyms Thattilla Kunnan, Kodappanilla

Kunnan, Koombilla Kunnan

Genome AB

Sub group Kunnan

Distribution Tamil Nadu and Kerala

Originally a backyard variety, now under commercial cultivation in Tuticorin and Tirunelveli district of

Tamil Nadu

Description

Stature Medium in size and sturdy

Leaves Dark green, erect with strong petiole

Bunch Slightly angular

Fruit Fruit tapers towards apex and has

lengthily pointed tip

Pulp Ivory white, very sweet, soft, mealy

in texture and tasty

Duration 14-15 months

Utility Dessert

Special uses Exclusively used for the preparation

of infant food. Maintained as backyard crop in households of rural Kerala and Tamil Nadu. Normally maintained in perennial clumps for year round supply of

fruits

Special features Immune to leaf spot diseases

Problems Ripe fruits easily drop off from the

pedicel

Name Poomgalli

Synonyms Valiya Kunnan

Genome AB

Sub group Kunnan

Distribution Tamil Nadu and Kerala

Description

Stature Medium, pseudostem is yellowish

green with dark blotches

Leaves Erect, dark green, leathery and wax

coated on the lower surface

Bunch Bunch is truncated cone shaped and

the hands are compactly packed

Exhibits extended female phase and

attractive fruits

Yield 10-12 kgs with a potential of 20 kgs

Fruit Long with 12-14 cm tapers towards

the apex. Starchy and used as infant

food

Pulp Firm, starchy, moderately sweet in

taste

Duration 14-15 months

Utility Dessert

Special uses Used in the preparation of infant

food

Tolerance to leaf spot diseases and suitability to marginal conditions, has made it popular in

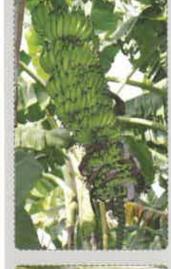
homestead gardens

Special features Tolerant to leaf spot diseases

Problems Both male and female sterile and has

less utility in breeding programmes













ADEKKA KUNNAN

THE RESERVE OF THE PERSON NAMED IN



Synonyms Adukka Kunnan, Octoman

Genome AB

Sub group Kunnan

Distribution Kerala and Tamil Nadu

Description

Stature Medium

Leaves Neither erect nor droopy, green and

shiny, broader than in other Kunnan

varieties

Bunch Medium with 7-8 hands, very

compactly arranged (hence could be

the name Adekka)

Yield 7-8 kgs

Fruit Small, short, smooth without any

ridges, ashy green at maturity and

ashy yellow upon ripening

Pulp Cream in colour, firm, sweet with

good aroma

Duration 11-12 months

Utility Dessert

Special uses Used for making banana powder/

flour

Special features Fruits are persistent and do not

shatter at ripeness, immune to leaf spot diseases. Occasionally set seeds and hence used in breeding

programmes as female parent

Problems Male sterile

PADALI MOONGIL



Name Padali Moongil

Synonyms

Genome AB

Sub group Kunnan

Distribution Southern Tamil Nadu and Kerala.

Cultivated in backyard gardens

Description

Stature Medium in size and sturdy

Leaves Dark green and erect. Petioles are

sturdy and strong

Bunch Horizontal or slightly angular. It is a

stable mutant without male bud. Normally 4-5 hands with 8-10 fruits

per hand

Yield 5-6 kgs

Fruit Fruits are long compared to other AB

diploids (25 to 28cm) tapering towards apex with a lengthily

pointed fruit tip

Pulp Ivory white, very sweet, less acidic,

soft, mealy in texture and tasty

Duration 13-14 months

Utility Dessert

Special uses Used for the preparation of infant

food like other Kunnan (AB)

varieties

Special features Ripe fruits easily drop off from the

pedicel















Chingan Name

Pacha Chingan, Chinga Bale **Synonyms**

AAB Genome

Nendra Padathi Sub group

Southern tips of Tamil Nadu and Distribution

Kerala

Description

Medium size, light green Stature

pseudostem with large dark brown

blotches

Withered bract and male flowers are

persistent below the bunch

Either erect or droopy, green on Leaves

upper surface and slightly wax

coated on lower surface

4-8 hands and loosely packed fruits Bunch

8-10 kgs Yield

Angular and more flattened, fruit tip Fruit

is blunt with persistent stylar base, thick fruit skin, remains light green

even after ripening

Lightcream, softand sweet

Pulp 12-13 months Duration

Dessert Utility

Suitable for higher altitudes Special uses

Has good keeping quality and fruits Special features

do not easily drop off at ripeness

Numaran Name

Ladan, Malaivazhai, Malai Kali **Synonyms**

AAB Genome

Sub group Pome

Endemic to Kolli Hills of Tamil Distribution

Nadu. Nurtured by Malyali tribes

Description

Medium, pseudostem is tall with 3.5 Stature

- 4.0 m height

Leaves are normal and the petiole Leaves

margins are pink shaded

Horizontal, 7-8 hands and are loosely Bunch

packed

8-9 kgs Yield

Angular and tapering towards the Fruit

apex. Fruit skin turns pale yellow

upon ripening

Cream in colour, very sweet and Pulp

highly fragrant

Duration 11-13 months

Utility Dessert

Special uses Pulp is preferable for making

Panchamritham

Special features Suitable for cultivation at higher

altitudes

Susceptible to Fusarium wilt (race 1), **Problems**

pseudostem borer and corm weevil











KULLAN

BORCHAMPA





Name Kullan

Synonyms Jawari Bale, Wather

Genome AAB

Sub group Pome

Distribution Tamil Nadu and Karnataka

Originally it is one of the a backyard varieties, now under commercial cultivation in Belgaum and Uttar Kannada districts of Karnataka

Description

Stature Very short with 1.6-1.8 m height.

Withered bract and male flowers are

persistent below the bunch

Leaves are normal and the petiole

bases are tightly clasped as in ABB

cultivars

Bunch Horizontal, 6-7 hands and are loosely

packed

Yield 6-7 kgs

Fruit Short with 8-9 cm length, angular,

green at maturity and turns

yellow upon ripening

Pulp Cream in colour, very sweet and

highly fragrant

Duration 10-11 months

Utility Dessert

Special uses

Special features Highly suitable for high density

planting, perennial system and for

cultivation at higher altitudes

Problems Ripened fruits easily drop off from

the pedicel

Name Borchampa

Synonyms

Genome AAB

Sub group Mysore

Distribution Assam

Description

Short with 2.0-2.3 m height, green

with large brown block blotches on

the pseudostem

Leaves Dark green, dull, droopy

Bunch Slightly angular, small with 4-6

hands, fruits, loosely packed

Yield 6-7 kgs with a potential of 12 kgs

Fruit Short and very stout, bold (120-140 g)

unusually plumpy fruits with a blunt

tip

Pulp Cream in colour, juicy, sweet with

aromatic flavor

Duration 12-13 months

Utility Dessert

Natural mutant of Mysore (Champa) which is nurtured by few households

in Assam inspite of its low yield

Special uses Most fragrant among Mysore group

Problems Poor yielder







MOTTA POOVAN

Motta Poovan

Synonyms

Name

Genome AAB

Sub group Mysore

Distribution Southern states of India, especially

Kerala

Description

Stature Medium

Leaves Dark green and dull

Bunch Medium size with 12-13 hands of

fruits as in Poovan

Yield 10-12 kgs which can go up to 15 kgs

Fruit Dark green, smooth, golden yellow

upon ripening, unusually blunt tip and lacks conspicuous bottle neck as

in Poovan

Pulp Creamin colour, with a good sweet -

acidic blend

Utility Dessert

Another natural and stable mutant of Mysore sub group (Poovan) with short, blunt fruits. They resemble miniature form of Maia Popuolu. Maintained in few households

Kerala for its uniqueness

Special uses Specially offered in temples

Special features Immune to Fusarium wilt disease

(race 1)

Problems Susceptible to Sigatoka leaf spot

disease and carries Banana streak

virus

THIRUVANANTHAPURAM

Name Thiruvananthapuram

Synonyms Kurangu Vazhai, Pisang Kelat

Genome AAB

Sub group

Distribution Kerala, Andaman and Nicobar

Islands

Description

Stature Medium size, pseudostem is

yellowish green, Male bud is unusually large and light purple in

colour

Leaves Green, broad, leathery and droopy

Bunch Slightly angular, 5-6 hands, loosely

packed

Yield 6-8 kgs with a potential of 12 kgs

Fruit Light green at maturity and golden

yellow upon ripening, thick fruit

skin

Pulp Orange in colour, with granular

texture, sweet with mild aroma

Duration 12-13 months

Utility Dessert

Special uses Used in Siddha medicine, nutritional

banana with good carotenoid content

Special features Immune to leaf spot diseases,

excellent fruit retention even at full

ripeness









DUDHSAGAR



Kalibow, Pisang Raja **Synonyms**

AAB Genome

Sub group

Karnataka and Kerala Distribution

Description

Medium Stature

Dark green, but not shiny Leaves

Slightly angular, 6-7 hands of loosely Bunch

packed fruits, cylindrical in shape

10-12 kgs Yield

Bold, dark green at maturity, Fruit

flattened, attractive yellow upon

ripening, fruit skin is very thick

Juicy, firm, sweet with good milky Pulp

aroma

12-13 months Duration

Dessert Utility

Maintained in backyard for its quality fruits and freeness from

major biotic and abiotic stresses

Immune to both Fusarium wilt (race Special features

1) and Sigatoka leaf spot diseases

Poor vielder **Problems**

CHINALI

Chinali Name

Chinari Synonyms

AAB Genome

Sub group

Tamil Nadu and Kerala Distribution

House hold cultivar which has

almost gone out of cultivation

Description

Medium, pseudostem is greenish Stature

yellow with pink tinges all along, withered bracts and flowers

persistent on the male axis

Light green, tender in appearance, Leaves

petiole margins are pink shaded

Pendulous, 5-6 hands, hands are Bunch

loosely packed, fruit hands completely turn towards the

peduncle

6-8 kgs Yield

Bold, dark green, golden yellow Fruit

upon ripening, slightly ridged

Juicy, orange yellow, very sweet in Pulp

taste with good aroma

12-13 months Duration

Dual, suitable for dessert and Utility

cooking purposes

Suitable for making chips Special uses

Carotene rich pulp Special features

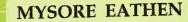
Poor yielder **Problems**













Synonyms

Name

Genome AAB
Sub group Plantain

Distribution Western coastal belts of Kerala,

Maharashtra and Goa

Description

Stature Medium in stature, 2-2.25 m height,

Pink tinged pseuodstem

Leaves Normal, green and thin texture.

Bunch Medium size with 5-6 hands, loosely

packed fruits, slightly angular in

position

Yield 9-10 kgs

Fruit Long with 18-20 cm like a small

plantain, pointed tip, dark green at maturity and turns to yellow upon ripening, fruit skin is thick with

persistent stigma

Pulp Creamin color, soft, sweet

Duration 11-12 months

Utility Dual purpose

Special uses Fruits are more suitable for making

banana chips

Special features Used for making banana figs

Problems Susceptible to nematodes and leaf

spot diseases

BARGI BALE

Name Bargi Bale

Synonyms

Genome AAB

Sub group Pome

Distribution Tamil Nadu and Karnataka

(especially in North Karnataka).

Description

Stature Pseudostem is tall with 4-4.5 m

height

Leaves are normal and the petiole

margins are pink shaded.

Bunch Slightly angular in position, 7-8

hands and are loosely packed

Yield 12-14 kgs

Fruits completely turn towards the

peduncle, angular and tapering towards the apex. Fruit skin turns

yellow upon ripening

Pulp Cream in colour, slightly acidic in

taste

Duration 12-13 months

Utility Dessert

Special uses

Special features Suitable for cultivation at higher

altitudes and intercropping in

coconut plantation

Problems Susceptible to Fusarium wilt (race 1),

pseudostem borer and corm weevil













KRISHNA VAZHAI



Synonyms Kalibow, Pisang Raja

Genome AAB
Sub group Pome

Distribution Tamil Nadu

Description

Stature Medium tall with 2.5 to 3.0 m height.

Pseudostem is completely covered by black pigments which extend up to the underside of the midrib. Pseudostem looks black hence the

name Krishna Vazhai

Leaves are normal and the petiole

margins are pink shaded

Bunch Horizontal with 6-7 loosely packed

hands.

Yield 8-10 kgs

Fruit Angular and tapering towards the

apex. Fruit skin turns yellow upon

ripening

Pulp Cream in colour, very sweet and

highly fragrant.

Duration 11-13 months

Utility Dessert

Special uses Pulp is preferable for making

Panchamirtham (a delicacy).

Special features Suitable for cultivation at higher

altitudes

Problems Susceptible to Fusarium wilt (race 1),

pseudostem borer and rhizome

weevil

NENDRA PADATHI

Name Nendra Padathi

Synonyms Kuthiraival Chingan

Genome AAB

Sub group Nendrapadathi

Distribution Southern tips of Tamil Nadu and

Kerala

Description

Stature Medium size with light green

pseudostem with large dark brown blotches, withered bract and male flowers are persistent all along the

male phase

Leaves Either erect or droopy, green on

upper surface and slightly wax

 $coated \, on \, lower \, surface \,$

Bunch 7-8 hands and loosely packed fruits

Yield 6-7 kgs

Fruit Angular and flattened, fruit tip is

blunt with persistent stylar base, thick fruit skin, remains light green

even after ripening

Pulp Cream in colour, very sweet and

highly fragrant

Duration 10-11 months

Utility Dessert

Special uses

Special features Suitable as an inter crop in coconut

and arecanut plantations under perennial system and for cultivation

at higher altitudes

Problems Ripe fruits easily drop off from the

pedicel

















Name Kechulepa

Synonyms

Genome ABB

Sub Group

Distribution North Eastern India, popular in homestead gardens of Assam

Description

Stature Very tall, about 3.5 m height and

robust, green pseudostem with pink

tinges

Leaves Dark green, droopy

Bunch Huge, pendulous, 10-11 hands with

loosely packed fruits

Yield 15-20 kgs with a potential of 25 kgs

Fruit Bold, pointed tip and thick fruit skin

Pulp Juicy, very sweet (>31°B)

Duration 12-13 months

Utility Dessert

Special uses Suitable for making value added

products like banana wine, juice and

figs

Special features Droopy leaves, no need for

propping, resistant to shattering

even at full ripeness

Problems Susceptible to Fusarium wilt (race 1)

and tall stature



Synonyms Mada Vazhai, Sapota aratti,

Nukkala Bontha, Ney Vannan

Genome ABB

Sub Group Peyan

Distribution Tamil Nadu, Kerala, Andhra Pradesh

and Karnataka

Description

Stature Tall (3.2-2.5 m) and robust,

pseudostem is green, ash coated and

with dark brown black blotches

Leaves Very long with 2.4 m length and

dark green, dull

Bunch Medium 5-7 hands with loosely

packed fruits

Yield 8-10 kgs

Fruit Short, stout, flattened, ashy green at

maturity and turns ashy yellow upon ripening, fruit skin is very thick

Pulp Juicy, sticky, orange yellow, rich in

carotenoid, granular and fibrous, good aroma and pleasant flavor similar to Sapota (Achras zapota)

15-16 months

Duration 15-16 month

Utility Dessert

Special uses Used in Siddha medicine as laxative,

highly valued for its therapeutic

uses

Special features Immune to leaf spot disease and

Fusarium wilt (race 1 and 2), fruits remain persistent even at full ripeness, suitable for perennial

cultivation

Problems Long duration











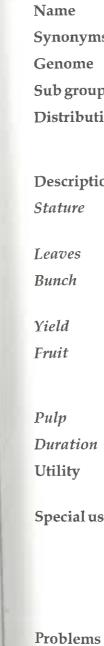




Nathe	oothi Bale
Synonyms G	Gobra Bale. Bontha Bale, Boodhi Bale
<i>Syllo21</i> ,	ABB
	Peyan
Dubarowr	Tamil Nadu, Kerala, Karnataka
Description	
Stature	Medium and stout, greenish yellow pseudostem with pink tinges. It differs from Peyan by droopy leaves
Leaves	Very long with (2-3 m) length and droopy, dark green and shiny
Bunch	Pendulous, 8-10 hands, compactly packed
Yield	12-13 kgs
Fruit	Short, stout, angular, ashy green at maturity, pale yellow upon ripening, fruits do not easily drop off
Pulp	Creamy in color, slightly hardy, juicy, less sweet
Duration	16-17 months
Utility	Dessert
Specialuses	Laxative, used in Siddha medicine for piles treatment
Special features	Immune to leaf spot diseases and needs no propping

Long duration

Problems



Name	Vayal Vazhai
Synonyms	Naadu, Ney Vannan, Nattu Pazham
Genome	ABB
Sub group	Bontha
Distribution	Tamil Nadu, Kerala and Karnataka. But a popular landrace in Madurai district of Tamil Nadu.
Description	
Stature	Medium in stature, green colour pseudostem with pink tinges
Leaves	Normal, green and shiny
Bunch	Medium with 7-8 hands, loosely packed fruits
Yield	10 <i>-</i> 12 kgs
Fruit	Short with blunt tip, green at maturity and turns to golden yellow upon ripening, fruit skin is very thick
Pulp	Creamin color, soft, sweet, juicy
Duration	12-13 months
Utility	Dual purpose (as vegetable and dessert fruit)
Special uses	Specially offered to God Azhagar of Madurai in Tamil Nadu. Because of good fruit quality and better yield potential, it has been elevated from homestead cultivation to a

commercial cultivar

Susceptible to Fusarium wilt (race 2)





NUTEPONG

PACHA BONTHA BATHEESA

Name Nutepong

Synonyms

Sub group

Genome ABB

Distribution North Eastern India (grown in most

backyards of Meghalaya)

Description

Stature Tall (3.2-3.5 m) and robust

Leaves Dark green on both surfaces

Bunch Huge, pendulous, truncated cone

shaped, 10-11 hands, loosely packed

fruits

Yeild 25-30 kgs

Fruit Bold, ridged, tip is neither pointed

nor bottle necked, starchy

Pulp White at unripe condition but cream

upon ripening

Duraion 11-12 months

Utility Dual purpose mainly as dessert

when no other banana fruits are

available in the market

Special uses Suitable for making bajji (a special

snack in South India)

Special features Suitable for marginal cultivation

No incidence of Fusarium wilt is

recorded in field till date

Name Pacha Bontha Batheesa

Synonyms Batheesa, Hazaria, Ayirangai

Genome ABB

Sub group Monthan

Distribution Tamil Nadu, Kerala, Andhra

Pradesh, Karnataka, Bihar, West Bengal and North Eastern India

Description

Stature Tall and robust, green pseudostem

and shiny

Leaves Dark green, shiny

Bunch Bunch is long and truncated cone in

shape with 20-23 hands of fruits and pendulous in position. Fruits are compactly packed, male phase is

more or less absent

Yield 25-27 kgs

Fruit Green in colour, fruits end with

conspicuous cap, fruit skin is very

thick

Pulp is starchy, creamy and

mucilaginous, fruits turn yellow

upon ripening

Duration 12-13 months

Utility Mainly for culinary purposes, but as

dessert in North East India

Special uses Suitable for making Bajji (special

snack in South India)

Special features High yielding

Problems Susceptible to Fusarium wilt (race 2),

sensitive to abiotic stresses









ma Subbaray

CB. India

KARTHOBIUMTHAM

PAGAR BANANA



Pordue Synonyms **ABB**

unique Sub group

North Eastern India with restricted Distribution

distribution

Description

Genome

Medium in size, pseudostem and Stature

sparingly wax coated

Dark green on upper side and shiny Leaves

Small, horizontal or slightly angular, Bunch

4-5 hands of loosely packed fruits. Plant is an unstable mutant for male

bud absence

7-10 kgs Yeild

Ashy green, long with 20-2 cm in Fruit

length and slightly pointed tip,

ashy yellow upon ripening

Cream in color and very sweet in Pulp

taste

12-13 months Duraion

Dessert Utility

Suitable for making banana figs and Special uses

wine

Resistant to root lesion nematode Special features

(Pratylenchus coffeae) and being used for gene expression studies. When male bud is absent fruits are long like Plantain and has potential for use in breeding against Xanthomonas wilt

Smaller bunch size and occasional **Problems**

reversions to produce male bud

Pagar Banana Name

Sagar Kol, Rigitchi **Synonyms**

Genome ABB

Sub group Unique

Distribution North Eastern India with restricted

distribution around Namsai Forest

area

Description

Stature Medium in size, Pale green

pseudostem with large brown

blotches

Green and dull in appearance Leaves

Bunch Small and slightly angular in

position, 5-6 hands, 12-14 fruits per hand which are moderately packed

Yield 8-10 kgs

Fruit Pale green, long with 14-16cm length,

angular/flattened with a blunt tip,

pale yellow upon ripening

Pulp Cream in color and starchy (tasteless)

12 13 months Duration

Utility Dual

Special uses

Special features Being starchy, used for cooking apart

from its dessert utility

Problems Smaller bunch









JILLEGUDEM COLLECTION

Jillegudem collection

Synonyms

Name

Genome ABB

Sub group Bontha

Distribution East Godavari district of Andhra

Pradesh

Description

Stature Medium in stature, 2.5-3 m, height,

pseudostem is green with pink tinge

Leaves Normal and green

Bunch Medium with 10-11 hands, loosely

packed fruits. Slightly angular in

position.

Yield 12-15 kgs

Fruit Short with 11-13 cm length, gradual

tip, dull green at maturity and turns

to yellow upon ripening

Pulp Cream in color, soft, starchy and

juicy

Duration 11-12 months

Utility Dual purpose

Special uses Unripe fruits are used as vegetable

for cooking

Special features

Problems Susceptible to Fusarium wilt race 2

NEY VANNAN

Name Ney Vannan

Synonyms

Genome ABB

Sub group Bontha

Distribution Tamil Nadu and Kerala

Description

Stature Medium in stature, 2-2.25 m height,

green coloured pseudostem with

pink tinges

Leaves Normal, green and shiny

Bunch Medium with 5-6 hands, loosely

packed fruits

Yield 10-11 kgs

Fruit Short with 9-10 cm lengths, blunt tip,

green at maturity and turns to yellow

upon ripening, fruit skin is very thick

Pulp Creamin color, soft, sweet, juicy

Duration 11-12 months

Utility Dual purpose

Special uses

Special features Medium stature

Problems Susceptible to Fusarium wilt race 2









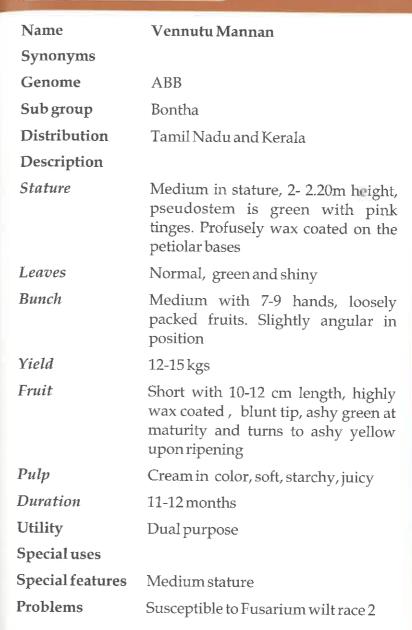








Name	Ginde
Synonyms	
Genome	ABB
Sub group	
Distribution	North Eastern India with restricted distribution
Description	
Stature	Medium in size, yellow green pseudostem
Leaves	Normal, dark on upper side and shiny
Bunch	Small, 5-6 hands with loosely packed fruits
Yield	5-6 kgs
Fruit	Ash coated, short and slightly rounded, blunt tip, ashy yellow upon ripening
Pulp	Orange color, dull sweet, carotene rich
Duration	12-13 months
Utility	Dessert
Special uses	Suitable for making chips and with low TSS (24°B)
Special features	Carotene rich pulp
Problems	Smaller bunches, less number of fruits in a bunch















Birubutia Name

Cherapadathi, Ashy Chakkia **Synonyms**

ABB Genome

Bluggoe Sub group

Bihar, Tamil Nadu and Kerala Distribution

Description

Tall with 3.2 -3.5m height and Stature

robust stature

Dark green on either surface and Leaves

shiny on upper

Huge, pendulous, cylindrical Bunch

shaped, 11-12 hands compactly

packed fruits

15-18 kgs Yield

Highly ash coated, bold, flattened, Fruit

ridged, tip is pointed. Ashy yellow

upon ripening

White at unripe but cream upon Pulp

ripening

11-12 months Duration

Dual purpose Utility

Suitable for making bajji (a special Special uses

snack)

Suitable for marginal cultivation. No Special features

report of field incidence of Fusarium

wilt race 2

Problems

Name Ankur II

Synonyms

Genome ABB

Sub group Pisang Awak

Distribution North Eastern India, popular in

homestead gardens of Assam

Description

Stature Tall with about 3.5 m height and

robust, reddish colored pseudostem

Dark green and shiny Leaves

Bunch Medium size, pendulous, with

loosely packed fruits, 9-10 hands

10-15 kg Yield

Fruit Green, smooth surface and not as

> much ash coating like other Pisang Awak members. Turns yellow upon

ripening

Pulp Juicy and sweet with 30°B

Duration 12-13 months

Utility Dessert

Special uses Suitable for making value added

products like banana wine, juice

and figs

Special features Pseudostem is very attractive with

red pigmentation

Problems Susceptible for Fusarium wilt (race 1)

and tall stature







ASHY BATHEESA



ABB Genome

Sub group Tamil Nadu, Kerala, Andhra Distribution

Mothan

Pradesh, Karnataka, Bihar, West Bengal and North Eastern India

Description

Tall and robust, green pseudostem Stature

and shiny

Dark green and shiny Leaves

Bunch is long and truncated cone in Bunch

shape with 20-23 hands of fruits and pendulous in position. Fruits are compactly packed, male phase is

more or less absent.

20-25 kgs Yield

Ash coated, fruits end with Fruit

conspicuous cap, fruit skin is very

thick

Pulp is starchy, creamy and Pulp

mucilaginous, fruits turn ashy

yellow upon ripening

12-13 months Duration

Mainly for culinary purposes, but as Utility

dessert in North East India

Suitable for making Bajji Special uses

Special features High yielding

Susceptible to Fusarium wilt (race 2), **Problems**

sensitive to abiotic stresses

MANGUTHAMANG

Name Manguthamang

Synonyms Borkal Baista

Genome **ABB**

Sub group

Distribution North Eastern India

Description

Stature Tall (3.5-3.8m) and robust, shiny

pseudostem

Leaves Dark green, shiny and droopy

Bunch Huge 10-12 hands in a bunch, loosely

packed fruits with a huge male bud growing almost upto ground level

Yield 15-16 kgs and with a potential of 20-

22 kgs

Fruit Ashy green, very long pedicel

PulpCream in colour, hard but juicy and

slightly acidic

Duration 16-17 months

Utility Dessert

Special uses Valued for therapeutic uses by North

Eastern Indian tribes as coolant, flower bud is popularly used as

vegetable

Problems Long duration



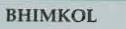






BHAT MANOHAR





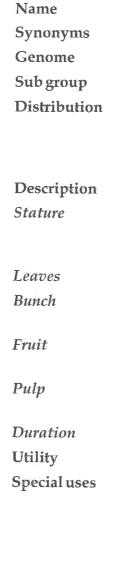


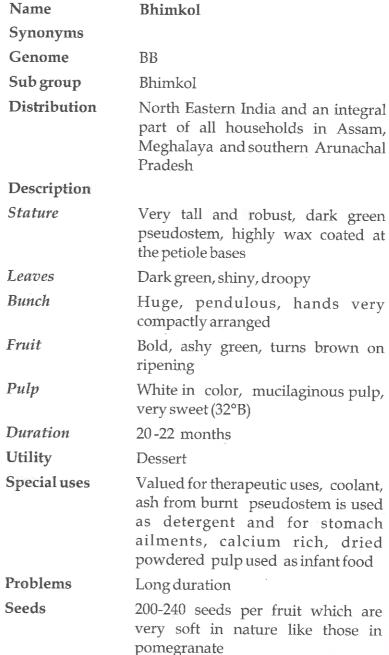






	Name	Bhat Manohar - A natural tetraploid
	Synonyms	
	Genome	ABBB
	Sub group	Pisang Awak
	Distribution	North Eastern India, a common homestead cultivar in Assam
	Description	
AL IN	Stature	Very robust , green pseudostem with pink tinge
三月	Leaves	Green, highly droopy
ESTANDADO	Bunch	Huge, cylindrical in shape, 10-12 hands, compactly arranged
3.0.00	Yield	15-16 kgs
Carried Control	Fruit	12-13 cm long, fruits are do not easily drop off at ripeness
THE PROPERTY OF	Pulp	Cream in color, sugary in taste (32°B)
	Duration	15-16 months
1000	Utility	Dessert
	Special uses	Resistant to leaf spot diseases, female fertile, used in banana improvement programme. Flower bud is used as vegetable and used in the preparation of pickles
	Problems	Long duration











ELAVAZHAI



Name

Elavazhai

Synonyms

Genome

BB

Sub group

Distribution

Western ghats of Tamil Nadu, Kerala

and Karnataka

Description

Stature

Very tall and robust, green pseudostem, slightly wax coated at

the petiole bases

Leaves

Green and erect

Bunch

Medium, pendulous, hands are very

compactly arranged

Yield

16-18 kgs

Fruit

Ashy green, turns ashy yellow on

ripening

Pulp

White in color, mucilaginous pulp,

very sweet (30°B)

Duration

22-24 months

Utility

Dessert

Special uses

Valued for therapeutic uses,

calcium rich, dried powdered pulp used as infant food. Leaves are more

suitable for leaf industries

Problems

Long duration



Ethnobotany of wild species and landraces of banana

S1. No.	Tribe	Location	Clone or type used	Plant part used	Methodology	Form used	Properties
H	Tagins and Nitshi	Tagins and Nitshi Subansiri district of Arunachal Pradesh	M.balbisiana (w) Pseudostem sap	Pseudostem sap	Collected from the wedge shaped cut on the pseudostem	Used for drink	Good for diabetes and stomach ailments
7	Ahoms, Bodo Hajong, Garo Mikir	Assam	Bhimkol Athiakol	Inner core of pseudostem and fruit peel	Cut into small Callec pieces, sun dried drink and burnt to get Addit ash meat	Called 'khar' drink Additive to meat	Drink as antacid, colic and for heart burn
8	Ahoms, Garo, Karbi, Bodo, Koch tribes Khasi	Assam, West Bengal, Bhimkol Meghalaya Athiakol	Bhimkol Athiakol	Pseudostem	Juice extracts by crushing pseudostem is filtered and consumed orally	Drink	To dissolve kidney stones, reduce stomach ulcers and for better bowel movement
# 4	Kuki	Themenglong, Imphal, Noney, Irang areas of of Manipur	M.balbisiana M.acuminata	Shoots	Fibreless inner shoots of young suckers	Salad and vegetables	
17							

	Mizo tribes Diphu Mizoram Assam tribes	Ensete glaucum	Leaf sheath	Cut into small pieces	Salad or vegetable	Source of fibre in daily diet.
Arunacha	All tribes of Tirap, Arunachal Pradesh Lohit districts	Musa balbisiana and edible clones	Young meristem of suckers	Chopped into pieces and added into	Vegetable	To removein advertent addition of
North-Eastern region		M.balbisiana	1 ft. long bits of leaf sheath on thepseudostem	11.00	Coolant	whilecooking For wrapping betel leaves and long distance transportatio
orth-Easte	rn region .	North-Eastern region M.balbisiana	1ft. of long bits of leaf sheath on the pseudostem		((.)	Sunshade for young transplants and seedlings
Assam		Bhimkol	Pseudostem	4-5 stems are tied parallel	As a raft to cross rivers and a mode of transportation during floods	11.80

Cooling and early healing effect	For relief from wheezing	Adds flavour to the beer.	Cheap source of roofing material	As an alternate vegetable source during dry periods.
Poultice against Cooling and burns early healing effect	ients	Lining for the wooden barrels	As roofing material for preparing temporary sheds and animal sheds	Vegetable
Fibreless young and unopened leaves are ground to paste	Ash obtained by Inhaled by burning leaves asthma pat	Water proof banana leaves after scorching are used as inner lining for	Dried leaves	Cooked with pulses and cereals
Young leaves	Leaves	Leaves	Mature leaves	Flower buds
M.balbisiana Bhimkol	Ensete glaucum	M.balbisiana Bhimkol	Bhimkol, Athiakol	M.balbisiana
Subansiri & Siang districts of Arunachal Pradesh	Kerala	T a n g a m , Dirang, West Siang, Sherdukpens, Upper Siang districts Mishmi Bodo, of Arunachal Lalung, Garo of Pradesh. Assam.	Arunachal Pradesh, Meghalaya, Tripura, Manipur	Assam, Arunachal Pradesh, Meghalaya, Manipur and Tripura
Apatani, Adi,	Irulas	Tangam, Dirang, Sherdukpens, Upper Si Mishmi Bodo, of Aruna Lalung, Garo of Pradesh. Assam	All tribes	Alltribes
10	H	12	13	14

	5	7		
Alternate source of vegetable during periods of dry Iseason and hunger	For relief from joint pains and for better blood circulation.	Antihelmenti c and tonic	Cheap source of animal feed	For washing clothes
Vegetable	Eaten with salt and oill	In ayurvedic preparations for herbal medicines	Cattle and pig feed	Detergent
Cooked with pulses	Boiled	Not revealed	Chopped and cooked with pulses	Cut into small pieces, sun dried and burnt to get ash
Yet to emerge Cooked with i m m a t u r e pulses inflorescence	Flowers	Root	Rhizome	Underground Inizomes
M.balbisiana, M.acuminata	M.acuminata M.balbisiana	M.acuminata M.balbisiana	All wild types of M.acuminata, M.balbisiana and all other landraces	Bhimkol Athiakol
	Arunachal Pradesh	st Bengal,	æ	Assam, Meghalaya and Lower Arunachal Pradesh
	Adi, Mishmi, Sherdukpens etc.	Ahoms, Garo, Assam, We Karbi, Bodo, Koch Meghalaya tribes Khasi,		All tribes of
13 0	16	17	18	19

For better fermenting of beer with fruity flavour.	Easily digestible for infants	Vermicompos t used as a biological manure for growth of crop plants.
Additive to cereal beer made of rice, sorghum etc	Baby food with rice or milk	Vermicompost
Pulp is mashed with water and sieved to remove seeds and mucilaginous pulp is collected	Pulp is mashed with water and sieved to remove seeds. Pulp is collected, dried as flakes and powdered	Finely chopped and mixed with soil. allowed to feed on plant waste and its excreta is collected for manuring
Ripe fruit pulp	Mucilaginous pulp of fruits	Whole plant
Bhimkol	Bhimkol, Athiakol	pun
Assam	Assam, West Bengal, Bhimkol, Meghalaya Athiakol	Assam, West Bengal, M.acuminata, Meghalaya M.balbisiana, o all other landraces
Ahoms, Garo, Khasi, Karbi, Bodo, Koch tribes	Ahoms, Garo, Karbi, Bodo, Koch Kribes Khasi	Ahoms, Garo, Assam, We Karbi, Bodo, Koch Meghalaya tribes Khasi,
20	21	22