

AN UNRECORDED BANANA CULTIVAR FROM SRI LANKA

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ABSTRACT

The genotype *Angaviaru* was originally collected from Bopitiya, a village located between Giriulla and Pannala in the Kurunegala District. Observations reveal that the rachis or male axis of this cultivar is clothed with the persistent relicts of the flowers and bracts, while the male bud degenerates at maturity. These are characteristics of the type of banana known as the French Plantain Type, a complex group containing at least nine forms, which have not yet been fully investigated. Of the 29 recorded Sri Lankan banana cultivars, *Wadane kehel*, *Randombe* (*Muwanethi kehel*), and *Kochchi kehel* do not have a male bud. This cultivar does not resemble any of those varieties or any of the cooking type cultivars such as *Mondan*, *Diyamondan*, *Etamuru*, *Alukehel* or *Sambel*. The fruit is 18.65 ± 0.81 cm long with a 15.48 ± 0.3 cm circumference in the middle, straight or slightly curved, cylindrical and prominently ribbed. The pedicel is more than 3 cm long. The pericarp (fruit peel) is more than 3 mm in thickness. The colour of the fruit is yellow-green (RHS 144B) when unripe and yellow (RHS 11A) when ripe. The flesh is orange in colour (RHS 24D) both in the unripe as well as the ripe stage. The apex of the fruit is angular-pointed. The ripe fruit is sweet and is preferred as a dessert banana by some people, and the green fruits appear to be a good cooking type.

KEYWORDS: *Musa*, Characterization, French plantain, Germplasm

INTRODUCTION

The banana (*Musa* spp.) is native to Southeast and South Asia and makes an important contribution to the international fruit industry in Southeast Asia (Valmayor *et al.*, 1991). Also there is no other fruit in the world, which surpasses banana and plantains either in production tonnage or in trade volume in fresh form (FAO, 1985). From its centre of origin in Southeast Asia, banana was introduced to all tropical and subtropical regions of the world where it gained great importance and popularity (Simmonds and Shepherd, 1955).

Of the numerous fruits grown in Sri Lanka banana claims 69-70% of the total area under cultivation. In Sri Lanka 29 banana cultivars and two wild species have been reported (Chandraratne and Nanayakkara, 1951 and Simmonds, 1966). Five of those are cooking types and the rest except the two wild species are dessert types. The Plant Genetic Resources Centre (PGRC) maintains 22 reported cultivars and the two wild species as well as two unidentified cultivars in the field gene bank.

MATERIALS AND METHODS

This germplasm, known locally by the name *Angaviaru*, was collected from Bopitiya, a village located between Giriulla and Pannala in the Kurunegala District, by Mr. R.D. Siripala, Assistant Director of the Agriculture. The PGRC could not identify this plant as one of the known cultivars and it was thus established in the field for characterization. Observation revealed that the varietal characteristics of this cultivar, except the fruit shape, do not resemble those of any of the reported cultivars of Sri Lanka. The fruit shape somewhat resembles *Kochchi Kesel* (*Nendran*, locally known as *Nethrampalam*). Major differences between *Angaviaru* and *Kochchi Kesel* are (1) Fruit hands in *Nendran* are subhorizontal or positively geotropic whereas immature fruits of the cultivar *Angaviaru* are at first negatively geotropic or curved back towards the stalk. Mature fruits of *Angaviaru* are subhorizontal. (2) *Nendran* does not have a rachis and male bud. Hence the cultivar *Nendran* is grouped under the Horn plantain type of the plantain subgroup. The *Angaviaru* fruit bunch possesses a rachis, which is fully covered with under-developed fruits and withered bracts.

According to Chandraratne and Nanayakkara (1951), bracts in all Sri Lankan cultivars except *Binkehel* (Dwarf Cavendish) are deciduous early. Although the behavior of the bracts is similar to those of *Binkehel*, other characteristics of this cultivar are completely different from those of *Binkehel*. Observations reveal that the rachis or the male axis of this cultivar is clothed with persistent male bracts and flower relicts while the male bud degenerates at maturity. These are characteristics of the type of banana known as the French plantain type, which belongs to the AAB genome group and is a complex group containing at least nine forms, which have not yet been fully worked out (table 1). Both the French plantain type and the Horn plantain type belong to the plantain subgroup.

The distribution of the plantain types presents some features of interest. 'French' plantains are known only in India, Africa including Egypt and America (Tackholm and Drar, 1954). Therefore we can assume that this particular cultivar is most probably an introduction from India. Some morphological and agronomic characteristics of the above mentioned cultivar are as follows.

Pseudostem

Pseudostem is about 3 m in height at flowering. Orange red (RHS 31C) in colour with brown blotches and shiny. Yellow green (RHS 146C) colour can also be seen in certain parts of the pseudostem. The predominant underlying colour of

the pseudostem is yellow green. The colour intensity varies from yellow green B through D of the value 152 in the RHS colour chart. Grayed purple (RHS 187A) spots can be seen on it. Pseudostem circumference at 1 m height from ground level is about 42 cm.

Table 1. The nine known forms of French plantain types recorded countries and their special attributes.

<i>Cultivar name</i>	<i>Country</i>	<i>Special attributes</i>
'Green French' plantain	Trinidad French West Indies	Upper leaf sheaths lightly marked with brown, no pink coloration
'Banana Creole'	India	
'Eleri'	Tanzania	
'Nkonjwa'		
'Pink French' plantain	Trinidad India	Upper leaf sheath and midrib tinged with pink
'Nendran'	Tanzania	
'Nshakara'		
'Wine' plantain	Trinidad	Leaf sheath and midrib bright red
'Banane rouge'	French west Indies	
'Velaththan'	India	
'Mchinja damu'	Zanzibar	
'Black French' plantain	Trinidad French West Indies	Sheath blackish-brown in colour
'Banane norie'		
'Tiger' plantain	Jamaica	Sheath, leaves and fruits spotted with blackish brown
'Banane Pace'	French West Indies	
'Giant' plantain	Trinidad	Bunches large and grow slow
'Banane cent livres'	French West Indies	
'Myindote'	India	
'Kaali eththan'	India	Fruits larger than usual
'Kaleththan'	India	Fruits shorter and blunter than usual
'Kichaange'	Zanzibar	
'Madre del platanar'	Colombia	A freakish "1000-fruited" form in which sex differentiation of the flowers breaks down and the bunch contains hundreds of persistent ovaries and floral rubbish but no properly developed fruits

Leaf sheath

Green yellow in colour (RHS 137A) with dark brown blotches at the base.

Petiole

Petiole margin colour (RHS 184C) is grayed purple (figure 1)¹. Edges of petiole margin are also grayed purple (RHS 187A). Petiole canal margin curved inwards. Colour of midrib abaxial surface is green yellow with pink-purple pigmentation whereas the adaxial surface is medium green. Fairly large, brown (RHS 200A) blotches can be seen on petiole base.

Lamina

The lamina is 145 ± 6.21 cm long and 58.6 ± 3.0 cm wide. Upper surface is green (RHS 137A); base rounded on one side and decurrent on the other. Lower surface is yellow-green (RHS 146B). A red purple colour line can be seen along the margin of the leaf blade. Grayed brown (RHS 199A) blotches can be seen especially on the leaf lamina of the water suckers.

Male bud

Bracts extend to the apex of male bud, which indicates closeness to either the AA or AAA genome. However, the male bud degenerates before maturity (no male bud exists at fruit ripening stage). External surface of the bract is gray-purple in colour (RHS 187A) whereas the inner face of the bract is red-purple (RHS 59B). Apex of the bract is not tinted with yellow. Bracts lift, but do not roll.

Female flower

No male bud exists and the female flowers (accordingly the fruits) extend to the tip of the rachis (figure 2). However, after the 4th or 5th hand the fruits remain small, about 8 cm long, but have a mature appearance with a dark green peel. The compound tepal of the flowers that form such underdeveloped fruits is orange in colour (RHS 27C) and yellow-orange tipped (RHS 21C). Length and width of the compound tepal of the normal female flowers are 5.16 ± 0.1 cm and 1.5 ± 0.05 cm, respectively. Rust-coloured spots can be seen on it. The free tepal is 2.64 ± 1.18 cm long and 2.32 ± 1.03 cm wide and is tinted with very pale yellow. The shape is more or less rounded. The apex of free tepal is triangular. Transverse corrugation can be observed below the apicula. Filament colour, style basic colour and the ovary colour are all the same, yellow-green (RHS 150D). The stigma is yellow-orange in colour (RHS 20B).

¹ Figures are provided in the plate at end of the paper.

Fruit bunch

Very lax and hanging at an angle of approximately 45° to the vertical.

Fruits

During the immature stage, fruits were curved upward towards the stalk (figure 3) and at the ripening stage fruits are more or less perpendicular to the stalk (figure 2), 18.65 ± 0.81 cm long and 15.48 ± 0.3 cm in circumference at the middle, Straight or slightly curved, cylindrical and prominently ribbed. Average fruit weight is 248.5 ± 6.41 g. The pedicel is about 3 cm long. The pericarp (fruit peel) is more than 3 mm in thickness, yellow-green (RHS 144B) when unripe and yellow (RHS 11A) when ripe. Flesh colour belongs to the orange group (RHS 24D) both when unripe as well as ripe. The apex of the fruit is angular- pointed. Even at the ripe stage, the base of the style is very prominent at its apex. The flesh of the ripe fruit is somewhat hard.

Utility of the cultivar

A tasting panel of sixteen people were provided with ripe as well as green fruits and asked to taste them both ripe and cooked as a curry. They had different opinions regarding the quality of this cultivar. Six out of the sixteen were of the opinion that this cultivar is most suited for making chips. Four people preferred this as a dessert banana. Three responded that they preferred this as a cooking type. Three stated that it was neither suited for dessert nor as a cooking type. Officers of the Food Research Unit (FRU) of the Department of Agriculture are of the opinion that this cultivar can be used as both a table type as well as a cooking type. A quality evaluation report supplied by FRU is given below.

Table 2. Food quality aspects of banana cultivar *Angaviaru*.

Attributes	Ripe	Unripe
% Moisture	62.6	59.9
pH	4.27	8.00
Brix	30	5
Peel weight (g)	58.0	50.0
% Flesh content	78.6	75.2
% Acidity (As citric acid)	0.60	-
Taste	Moderately sweet & slightly acidic	-
Texture	Slightly hard	-

As indicated in the table 2, this cultivar possesses a very high brix value, which indicates high sugar content. Compared to this, the cultivar *Embul* (Mysore) has lower Brix values of approximately 24-25 and acidity around 0.3 (S. Ekanayake, personal communication). According to the food quality analyst, when cooked as a curry it is very slightly acidic, perhaps due to the presence of a fairly high acidity level (table 2).

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Figure 1. Extensive pigmentation of petiole margins



Figure 2. Fruit and bunch characters has at ripe stage



Figure 3. Fruit and bunch characteristic before ripening