Plantain subgroup

Plantain is the name of a large group of bananas that has upwards of 100 cultivars[1]. The expression "bananas and plantains" has created confusion as to what Plantains are[2]. The expression was coined to raise awareness on the importance of cooking bananas for food security, but in doing so it helped spread the misconception that the word "banana" refers to dessert bananas only. Paradoxically, FAOSTAT which keeps tabs on bananas and plantains has led to an underestimation of the importance of cooking bananas in global production, and by extension an overestimation of the dessert types[3]. In Spanish, plátano, from which is derived the term plantain, is often used to refer to all types of bananas.

The genome of Plantain cultivars, shorthanded AAB, denotes that these bananas have three sets of chromosomes and that they are hybrids of Musa acuminata and Musa balbisiana in a proportion of roughly two to one. Even though bananas originate from the Asia-Pacific region, the diversity of Plantain cultivars is highest in Africa, especially West and Central Africa. This diversity was created locally by farmers selecting and vegetatively propagating natural mutants derived from the maybe more than one cultivar introduced to the African continent. Archaeological evidence in the form of phytoliths suggests that bananas were being grown in southern Cameroon during the first millenium BC[4]. The diversity of Plantains in the Democratic Republic of Congo is believed to be one of the highest in Africa[5]. The Plantain cultivars grown in Latin America were introduced from Africa during the slave trade.

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Morphological characteristics

The cultivars in this subgroup display a wide range of morphological characters, from plants with a large bunch and male bud, to plants with only a few fruit and no male bud. As bunch weight decreases, the average fruit weight tends to increase.

The following traits, recorded on 55 cultivars from the Democratic Republic of Congo, have been proposed as being potentially characteristic of the subgroup[6].

**Pseudostem**: Moderately waxy leaf sheaths; watery sap; suckers close to the mother plant and between ¼ and ¾ the height of the mother plant.

**Petiole canal**: Margins curved inward, winged and clasping the pseudostem; dry wing type; green petiole margin with a colour line along its edge; margin width ≤ 1cm.

**Leaf**: Shiny upper surface; dull lower surface; moderately waxy leaves; symmetric insertion point of the leaf blades on the petiole; rounded leaf blade base on both sides; intermediate leaf corrugation; large purple blotches on the leaves of the water suckers.

**Peduncle**: The peduncle is slightly hairy.

**Fruit**: Pronounced ridges; hairless pedicel surface; slightly to not fused pedicels; high adherence of the peel (the fruits do not peel easily); persistent fruits (do not fall from hands at maturity); firm pulp texture.

A number of traits are used to distinguish cultivars: bunch orientation (see photos) and density (very compact, compact and lax), the number of hands, size and shape of the fingers (straight, straight in the distal part, curved and S shapes), size of the pseudostem, presence or absence of the male bud, colour of the pseudostem (various shades of green, red, or violet), peel colour of immature fruit (various shades of green, red, yellow and brown).
Clusters

Norman Simmonds recognized two types of Plantain cultivars distinguished by the presence of the male bud (French) or its absence/degeneration (Horn)\(^7\). Two types were later recognized: False Horn\(^8\) and French Horn\(^1\). A study of the morphological diversity of 97 accessions collected in the Democratic Republic of Congo recognized three types: French, False Horn and Horn\(^9\).

French

French types have persistent bracts on the rachis and a large male bud. French types are commonly subdivided into size categories: giant, medium, small. The medium and small French types produce more suckers than the giant French types.

Since the height and girth of the pseudostem vary with the environmental conditions, the number of leaves produced from planting to flowering is used to determine the size class: giant (more than 40 leaves); medium (between 32 and 38 leaves); and small (less than 30 leaves)\(^8\). Most of the French types characterized by large bunches that contain many hands and relatively small fruits. These cultivars have a long vegetative cycle and are susceptible to toppling in windy conditions.

French Plantain cultivars are called Plátano Hembra in Central America, Congo in Puerto Rico and banane blanche in the French West Indies\(^8\).

Examples of cultivars: 'Obino l'Éwai' (Nigeria), 'Nendran' (India), 'Dominico' (Colombia)

French Horn and False Horn
The male bud of both French Horn and False Horn types degenerates at maturity. French Horn types have a high number of neutral flowers, whereas False Horn types retain only a few neutral flowers\(^1\). Both types have large fingers, but the bunch of a French Horn is dense. The plant size categories are also different. For example, a medium French Horn is taller than a medium False Horn.

Examples of French Horn types: 'Batard' (Cameroon), 'Mbang Okon' (Nigeria)

Examples of False Horn types: 'Agbagda' and 'Orishele' (Nigeria), 'Dominico-Harton' (Colombia)

**Horn**

Horn types tend to produce very few fruit spread over one to five hands (exceptionally eight to ten). The rachis ends after the last hand. No male bud is produced.

Horn types are called *Plátano Macho* in Central America.

Examples of cultivars: 'Ishitim' (Nigeria), 'Pisang Tandok' (Malaysia)

Since the French types are the only ones to have a complete inflorescence, they are believed to be at the origin of the other types. The degeneration process from French to Horn types is believed to have taken place in six phases\(^10\):

- **Phase 1**: The basal male flowers experience an ‘ovary’ hypertrophy.
- **Phase 2**: The male flowers (especially the basal ones) remain attached to the floral axis.
- **Phase 3**: The total number of hands and flowers decreases, but the male bud persists to maturity.
- **Phase 4**: The male bud is quickly exhausted. At maturity about forty hands, containing flowers with a half-reduced ovary and sometimes developed as small bananas, are observed.
- **Phase 5**: No trace of male bud. The last female hands also disappear. Some cultivars produce only one hand or one very large banana.
- **Phase 6**: The floral axis no longer bears fruits. Two or three very thick but very narrow bracts hang from the sterile glomerules.

**Dwarfism**

The Plantain subgroup also has dwarf and semi-dwarf cultivars. Dwarfism is characterized by a lower leaf ratio (length/width) than the one measured on giant, medium and small types. The leaves of dwarf types are also more erect.

**Agronomic performance**

Plantain cultivars require a warm and humid climate with no major oscillations. They will generally not survive a dry season that lasts more than 3 months and temperatures below 10°C for more than a few nights. Exceptions are cultivars such as 'Vuhembe', which has been found growing at 2,172 m in North Kivu, the Democratic republic of Congo\(^6\).
Most Plantain cultivars exhibit strong apical dominance, which suppresses sucker growth until after bunch emergence. They then tend to remain small because of competition with each other.

The shallow and poorly ramified root system of Plantain cultivars also makes them susceptible to 'high mat', the tendency of the plant base to grow out of the soil.

References

2. The origin of the expression “bananas and plantains”
3. Slippery uses of banana statistics, a blog post on the misuse of statistics and the habit of splitting bananas into bananas and plantains.
5. The Plantains of the Democratic Republic of Congo in the 28 July 2014 issue of InfoMus@.

News and blogs related to Plantains:
- The hidden side of banana diversity
- Dialogue on the future of plantain-based cropping systems
- The original banana split
- The Plantains of the Democratic Republic of Congo
- The year of TR4

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