

Banana flowering in the Subtropical Garden in 2021

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Bananas form a distinct family of plants, most closely related to the Bird of Paradise flower *Strelitzia* of South Africa and the hot-house flower *Heliconia* from South America.

The great 18th Century naturalist Carl Linnaeus named the plant *Musa Paradisiaca* in botanical Latin. He looked after one in a garden he curated in the Netherlands and made it flower in 1737, the first to do so in Europe. That plant was presumably brought back by the Dutch East India Company. While we associate bananas with the West Indies and Canary Islands, the largest producers today are India and China. There are about 40-70 species (it depends who's counting) but the edible bananas are all sterile hybrid offspring of two East-Asian species which can be seen in the Tropical House at Kew.

One of the commonest edible varieties today is the Cavendish, named after the 6th Duke of Devonshire whose Head Gardener, Joseph Paxton, received a specimen in 1830. 'Musa' probably comes from an Arabic word for the fruit and 'paradisiaca' reflects a notion that it was the forbidden fruit in Eden. The larger starchier varieties are 'plantains' which are widely available in shops on Battersea Park Road.

Our bananas in the Subtropical Garden have not flowered for a while but one did so last year. They are not the edible variety and have been bred as cold tolerant ornamental plants. Like cacti, they can tolerate the cold but not the cold and wet. Thus, with the onset of winter, their leaves are cut back and the plants are wrapped up in straw and fleece. Since most of the above-ground growth is the leaves, this does not leave much. They have a central stem but rather like a gladioli flower or, better, a Canna lily, this is densely clasped by the leaf

stalks and leaf bases that are folded concentrically. Leaves only splay out in their upper parts and they look ragged because they easily tear along the line of the leaf veins, which makes them less susceptible to more severe wind damage.

The quite thick unbranched stem is up the centre and the flowers form on the part that emerges above or between the blades of the leaves. The structures are a bit mystifying at first glance.

What you see is an inflorescence i.e. a cluster of flowers at the end of a single stem. The stem curves downwards in our plants and at the tip is a huge tulip shaped bud in which there are the pollen producing male flowers. Further back on the stem are the female flowers that form the bananas. They form clusters or 'hands' on a shared short stalk. Unfortunately, by the time any of us saw them they had 'gone over' and formed the fruits which look like hands of miniature green bananas. You can still make out the remains of flower parts (a petal and pistils) in some of the pictures.

As noted, these are sterile hybrid plants but, in any case, there were no others in flower to cross-fertilise them. Nor are there many pollinators which, in the wild, are fruit bats and sometimes tree shrews. Thus, although these bananas produce seed precursors ('ovules') in three chambers that extend along the length of the fruit, they remain sterile.

Wild bananas have the same structure but the pollinated seeds are larger and hard-coated making them unpleasant to eat.

The large 'male' bud consists of numerous nested layers of male flowers sandwiched between large, leaf-like flaps. Each layer opens one at a time from the base of the bud. In

our plants, this pollen is sterile but in the wild it would be taken to another plant whose female flowers had just opened. The flowers last a few days and then both they and the protective flap fall off leaving a scar on the stem which then lengthens a little and the next layer opens. It seems to run out of steam well before many of the layers open so you will eventually find at least a small remaining unopened bud. The bud we illustrate still had some way to go.

So what did Linnaeus do to get that banana to flower and fruit in the Netherlands when others had tried and failed? Our bet is that he was lucky with the weather that year, but some research at the library at the Linnean Society is in order and I will report back in a later issue of Review.

Eat bananas while you can. The Cavendish variety is under threat from disease: <https://www.bbc.co.uk/news/uk-england-35131751> reveals an all too common story associated with intensive agriculture today.

Pictures by Sally Orman and Brian Livingstone

The specimens were collected when the plant in the Subtropical Garden was cut down for its winter dormancy.

Fig 1. The flowering banana. Female flowers have fallen and the banana fruits are in green 'hands'. The male flowers can be seen, protected by a large flap-like 'bract'. Two or three male clusters can be exposed at once.

Fig 2. Female portion of the inflorescence. The banana clusters or hands have formed but they will not be edible. The white circle delineates a cluster of fruits that still have female flower remnants (petals and pistils) attached to their apices.



Fig 1.



Fig 2.



Fig 3. Structure of the fruits. 1. Cross-section of fruit showing 3 spaces (“loculi”) containing the seeds. 2. Edible banana cross-section for comparison.



Fig 4. Male portion of the inflorescence. 1. Open male flowers under the protective bract or flap. 2. Close-up of the open flowers. 3. Longitudinal section through the male bud showing nested bracts and layers of flowers.

