

The Ginkgo Tree

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Ginkgo trees are to be found all over Battersea Park. A number of them are old but there are many have been planted recently. They are recognized by their characteristic leaves (fig.1).

Their triangular or fan shape is divided into two lobes, hence their Latin name *Ginkgo biloba*. However, the size of the cleft is variable. These leaves have no midrib, unlike for other trees. In more mature trees they grow as clusters on short branchlets (fig.2) but in saplings they are on single stalks from the main stem.

Male and female trees are separate (figs. 3, 4 &5). Botanically, the reproductive structures are not flowers. The ginkgo belongs to the ancient group of plants known as gymnosperms (“naked seed”), that is, its seeds are not enclosed in a fruit at any stage of their development, although they do look like small plums. By contrast angiosperms (“vessel contained seeds” from Greek *angeio* meaning vase) evolved more recently and include the broadleaf trees such as oak, beech and lime. These are flowering plants, in which the unfertilized seeds (ovules) are protected and develop in a closed chamber, the carpel. After fertilization the angiosperm’s carpels develop into one of the very numerous types of fruits containing seeds.

The pollen of the male ginkgo is produced from little sacs on the inner aspect of small catkins or cone-like scales and this is similar to the pollen cones of pines and other conifers (which are also gymnosperms). Production is profuse and the pollen can be very allergenic.

This is unfortunate because, for a long time, males have been preferentially planted, especially as street trees. The pollen is windborne to female trees and insects are not usually involved. The still air this year has meant that

seed production has been poor.

A sectioned fallen seed (fig.6) shows the fleshy seed coat surrounding the hard centre which contains the embryo plant and a food reserve to get it off to a good start when germinating. The outer fleshy coat has an unpleasant smell especially when crushed or trodden on, which is why female trees have only rarely been planted in streets.

Fossils that look similar or identical to *Ginkgo biloba* are found in rocks dating from the time of the dinosaurs 60-240 million years ago and fossils that are obviously ginkgo ancestors or relatives are found before that in the Permian period rocks from over 250 million years ago. By comparison, fossil flowering plants only begin to appear in the mid-Cretaceous period, 100 million years ago. Thus, it seems probable that the dispersal of ginkgo seed occurred when they were eaten by dinosaurs and passed out in droppings. However, by the time dinosaurs became extinct, 60 million years ago, ginkgos were already becoming less frequent in the fossil record. Probably they were being displaced by the flowering plants and trees. Perhaps mammals did not like the seeds, although something, probably squirrels, chews some of the fallen ones in the Park.

At any rate, ginkgo become steadily rarer and disappear by around 2.5 million years except in a small area of China. Now, they are possibly extinct in the wild. There are no ginkgo forests. Humans have taken over from the dinosaurs in dispersing the seeds and for well over 1,000 years they have been cultivated in temple and monastery gardens by Buddhist monks. In this way they were introduced into Korea and Japan in historical times. At first, their attraction may have been as food and for the medicinal qualities

of their seeds. The latter may include improved blood circulation to brain and heart as well as anti-inflammatory actions. Orthodox Western medicine rates these as unproven but they are still widely used with apparent benefit.

One feature that might have been very attractive to the temple gardeners, is their autumn colour (fig.7). Many specimens become really yellow and the fallen leaves of the best ones can look like a cloth of gold on the ground.

Ginkgos are very long lived, though claims of 1,000 years should be accepted with caution. The first one in Britain has been growing well at Kew since 1762 and they were soon being planted on country estates. They have been resistant to disease and pollution. There are 6 famous trees that survived being about 1 mile from the atomic bomb at Hiroshima (where nothing else survived). The ginkgo has no surviving closely related species and is unique amongst living trees.

Contact batterseaparktrewatchers@btinternet.com if you would like to discuss trees or other flora of Battersea Park with the authors.

Photo credits

Fig 3 & 4: *Ginkgob*, CC BY-SA 3.0, via Wikimedia Commons

Fig 5: *Brian Livingstone*

Fig 6: *Aomoricuma* CC BY-SA 3.0, via Wikimedia Commons

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Fig 1. Leaves from the same branch, showing the variable degree of lobe formation



Fig 2. Leaves arising as clusters on short shoots or branchlets



Fig 3. Male reproductive structures. The pollen is shed from between the scales of the cone-like clusters.



Fig 4. Female ovules (“little eggs”) sitting on the tips of stalks (arrow) waiting for fertilizing pollen to blow onto them. There are two on each stalk but often only one develops. There are no flower parts like petals

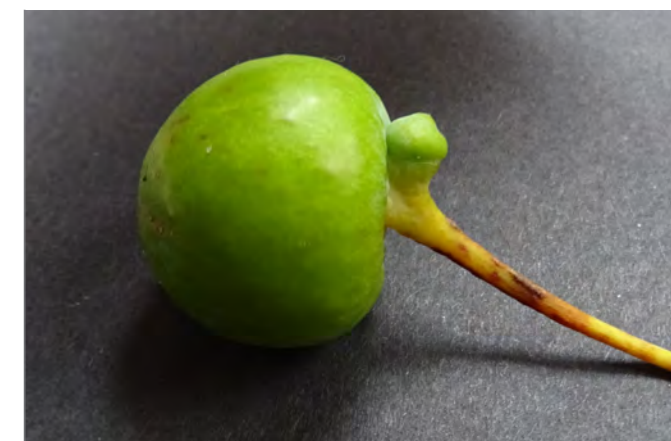


Fig 5. Maturing seed with aborted ovule on same stalk. Seeds do not come much more “naked” than this. The whole of the large cherry-like globe is a seed, completely exposed on the end of its stalk. When fully mature the seed is more yellow but, in the Park, many fall while still green



Fig 6. Seeds. Above: The soft seed coat cut away to expose the hard centre. Top Right: the hard centre, sectioned. The green tissue contains an early embryo surrounded by a food reserve. This seed was still immature. Right: The hard centres can be eaten and are sold as food



Fig 7. Young ginkgo in the Park, September 2021, showing change to bright yellow autumn tint