

# *Fagus sylvatica* 'Atropunicea'

## Evolution

This tree belongs to the dominant group of plants on Earth – the broadleaf plants. They are an evolutionary improvement on conifers: their wood structure allows a stronger and freer flow of sap, allowing their leaves to evaporate more water and photosynthesize more quickly.

Further, starting with the ancient Magnolias being pollinated by beetles rather than the wind, insects pollinate these plants. Thus the trees need less pollen so less protein is needed, and the more easily manufactured sugars produce the nectar that attracts insects. Trees therefore can produce seeds more likely to germinate even if not in a mass of trees of the same type.

These plants are related to those of the tropical forests of long ago, but have adapted to cold weather in three ways: some modified their leaves to become thicker and tougher (more like the conifers) and are the evergreen trees, became herbaceous (these are no longer trees) or became deciduous.

The broadleaves developed an ovary to contain seeds, so are angiosperms.

## The Beeches

The family includes oaks, sweet chestnuts and beeches. *Fagus sylvatica* is the European beech, though beeches grow in the three northern continents as well as south of the Equator.

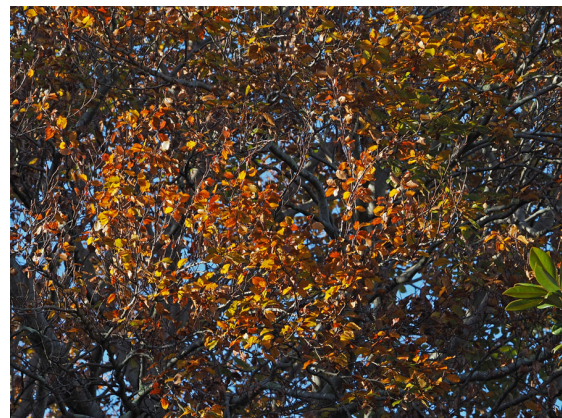
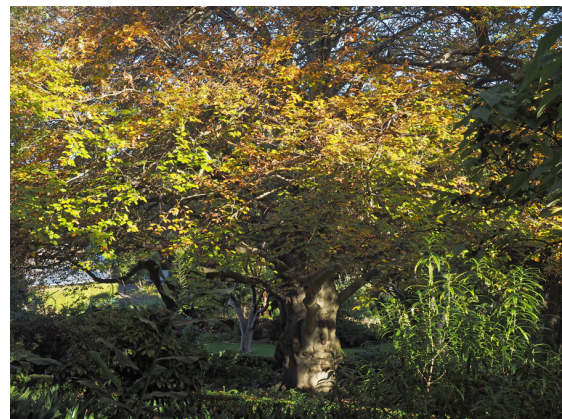
There are 8 or 9 species of this plant, but these are almost interchangeable, indicating that this plant may be at the end of its evolutionary development.

## Features

The tree can live for 400 years.

It grows to around 30 metres, with a dense canopy of horizontally aligned branches that allows little sunlight to penetrate. The branches grow almost to the ground.

The tree is shallow rooted, with fine roots filling the surface of the soil. These features mean that little can grow under a beech forest canopy. The limited sunlight means also that the trunk is protected, as the cambium is close to the outside surface. The trunk is silvery and when wounded does not heal easily.



### Photos from the top:

1. The undersides of the leaves are green in summer, 7 Dec 2014;
2. The upper sides of the leaves are purple in summer, 7 Dec 2014;
3. Some leaves are turning from green to gold, 8 May 2015;
4. Other leaves are beginning to show their copper colouring, 8 May 2015



It does not like water-logged soil and thrives in lean, chalky soil where other species cannot grow. Redness of foliage varies and there are a number of names for species, depending on the perceived “redness”. Our old specimen has two labelled names – “Copper” and “Purple”. “Cuprea” (copper) refers to the lightest colour, and “River’s Purple” refers to the deepest red, but individual plants vary in colour throughout the seasons.

In former times the red colour was thought to indicate the mark of nature’s disapproval.

Beeches are monoecious – both male and female flowers are produced.

The seeds are enclosed in the woody bases of the flowers that grow to encase the seeds. These beechnuts or beechmast are covered with woody spines. The seeds are edible though high in tannin.

### Etymology

There are two interesting links in language with the beech tree.

The first is the name “Buckinghamshire” – the “buck” in this word is the old word for “beech”.

The second is our modern word “book”, linked to the beech tree since beech tablets were used to write on before paper became plentiful. Old English is “boc”, Old Norse is “bok” and there are further links in modern German, Dutch, Swedish and Russian.

### The trees in the Geelong Botanic Gardens

The old tree in the northern section is around 155 years old, and was probably planted by Daniel Bunce. Its canopy is sparser this year, though it has fruited more abundantly than usual.

It has branches that over the years have grown together, the term for this being *inosculation*.

There are two young trees that were donated by Dr Elizabeth Kerr that are 10-12 years old, one in the Oak Lawn and the other in Salvia Bed No. 2, west of the large banana. Both are dark red and have abundant leaves.



#### Photos from the top:

1. The branches turn horizontal, 6 Jan 2017;
2. Bare winter branches show the tree’s structure, 29 Jun 2016;
3. Young Purple Beech in the Oak lawn near the Perennial border, 18 Dec 2016;
4. New red leaf on that young tree, 18 Dec



## Uses

There are a lot of uses for this beautiful tree.

- A) It is excellent firewood and easily split.
- B) Slats of beech that have been leached in caustic soda are spread in the bottom of fermentation tanks to give their flavour to Budweiser beer.
- C) Beech logs are used to dry the malts for some of the German smoked beers. They are also used to flavour smoked sausages, ham and cheeses.
- D) The young leaves can be eaten in salads.
- E) The fruit can be ground for flour once the tannins are leached out.
- F) The fruit can be pressed for oil, and this was once used for cooking and for lamp oil.
- G) The timber is good for buildings, furniture and stocks of rifles.
- H) The pigment "bistre" is beech wood soot.
- I) Beech wood makes good drums.
- J) The leaves were used to stuff mattresses and pillows.
- K) The leaves have been used to dye fabric.
- L) Modal is a kind of rayon made from the reconstituted cellulose of pulped beech wood.

**Family:** Fagaceae

**Genus:** *Fagus*

**Species and Common name:** *Fagus sylvatica* 'Atropunicea', Purple or Copper Beech

**Origin:** Europe, Western Asia

**Origin of the name:** See Etymology, above.

**Longevity:** To 400 years

**Species size:** 25-35m high, 3m Diameter Trunk, 15m spread

**Size of mature Beech in GBG:** National Trust measurement 28/3/2004: 20 m high, 1.7m diameter, 21 x 24m spread

**Date planted:** About 1859

**Heritage Listed:** Heritage Victoria and National Trust, T11589

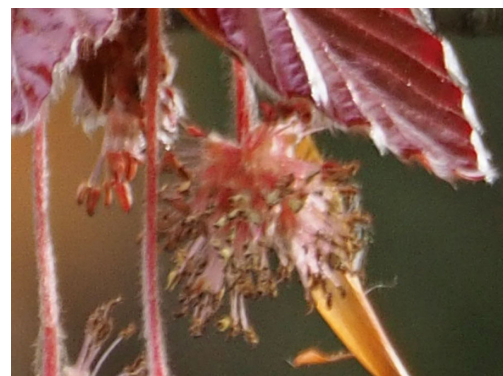
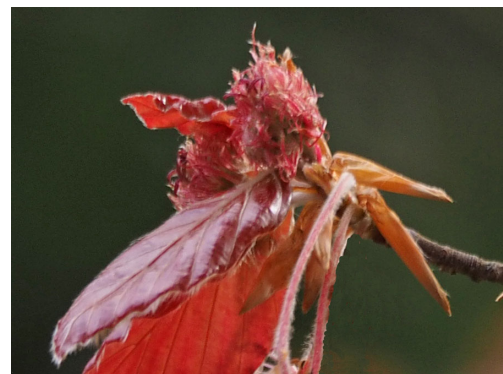
## References:

*Encyclopaedia of Trees* by Hugh Johnson

*The Plant Book. A Portable Dictionary of Vascular Plants* by DJ Mabberley

*Wikipedia*

Thanks also to Phil Mulroyan, GBG



**Photos from the top:** 1. Spring twig with new red leaves and flowers, mature tree;  
2. Detail showing female flowers;  
3. Detail showing male flowers.  
Photo: 19 Oct 2016.  
4. These Beech branches at GBG have grown together. This is termed *inosculation* (kissing). 6 Jan 2017.



XVI, 5.

III. Cupuliferæ.



100. *Fagus sylvatica* L. Rotbuche.

**European beech *Fagus sylvatica*:** A. Flowering twig with female flower on upward stem and male flower on hanging stem; B. Fruiting twig with fruit before opening (dehiscing), valves (segments) of the dehiscent fruit open with seed inside; 1 male flower with calyx; 2 male flower longitudinal section; 3 stamen; 4 female flower; 5 seed; 6 seed cross-section; 7 seed with husk removed. Prof. Dr. Otto Wilhelm Thomé 'Flora von Deutschland, Österreich und der Schweiz, Nur Tafeln', 1885, Gera, Germany. Image: Kurt Stueber, www.biolib.de CC BY-SA 3.0

# Geelong Botanic Gardens Map

