

Angophora Dr Barbara Radcliffe

Gum trees are a well known icon of Australia. The scent of gum trees as well as their form and resilience to fire and drought are well-known characteristics. Most, but not all, gum trees belong to the genus *Eucalyptus*, although we are allowed to refer to all gum trees as eucalypts or gums. Formally the eucalypts are divided into three genera: *Eucalyptus*, *Corymbia*, and *Angophora*.

The genus *Corymbia*, or blood woods, was defined as separate from *Eucalyptus*, as recently as the mid-1990s. Well known species include *C. citriodora* (Lemon-scented gum) and *C. ficifolia* (Red flowering gum). These species are readily observed in Adelaide. There is a fine example of *C. citriodora* near the small pond towards the lower end of the water course in the Arboretum as well as those that line the Eastern end of the main drive. *C. ficifolia* is a popular street tree and when in full bloom in mid-summer delights us with its profuse flowers that may range in colour from cream to pink to scarlet. In addition, its plentiful supply of nectar attracts numerous nectivorous insects and birds that add to the show.

So that gets us to *Angophora*. According to DNA studies, *Corymbia* and *Angophora* are more closely related to each other than to members of the genus *Eucalyptus* which seems to have had a more ancient origin.

The genus *Angophora* has the smallest number of species (14) which hail from coastal areas of southern Queensland, New South Wales with one species *A. floribunda* native to New South Wales, Queensland, and Victoria. Distinguishing characteristics of *Angophora* sp. include mature leaves in an opposite arrangement and flowers (always cream-colour) that have prominent stamens, but also small petals. On the other hand, members of the genus *Eucalyptus* usually have mature leaves arranged alternately (there are exceptions in the case of mature leaves, and juvenile leaves are usually opposite). The petals of *Eucalyptus* flowers are fused to form a 'cap' that falls off to liberate the stamens surrounding the pistil. The woody fruits of *Angophora* resemble 'gum nuts' but are always ribbed.



Glycyphana stolata or the Brown flower beetle feeding on *Angophora floribunda*. This beetle is an Australian native introduced from the eastern states and feeds on nectar. Julie Paulus ID SA Natureteers photo JB



Angophora (cont.) Dr Barbara Radcliffe

One of the most commonly grown species is *A. costata* (Smooth-barked apple or Sydney red gum) which is a handsome, large tree with fresh bark distinctively coloured pink or orange that fades to grey in winter before shedding again. There are five specimens of *A. costata* in the Arboretum. Due to its large size up to 30 m tall, it is best suited to large public gardens.

Another popular species is *A. hispida*, commonly known as Dwarf or scrub apple. It grows as a mallee form or small tree to about 7 m. Attractive features include red new foliage and profuse white flowers that may attract nectivorous birds, bees, moths, butterflies, and various species of beetles. The Arboretum sports four specimens of *A. hispida* as well as one *hispida* X *floribunda* hybrid.

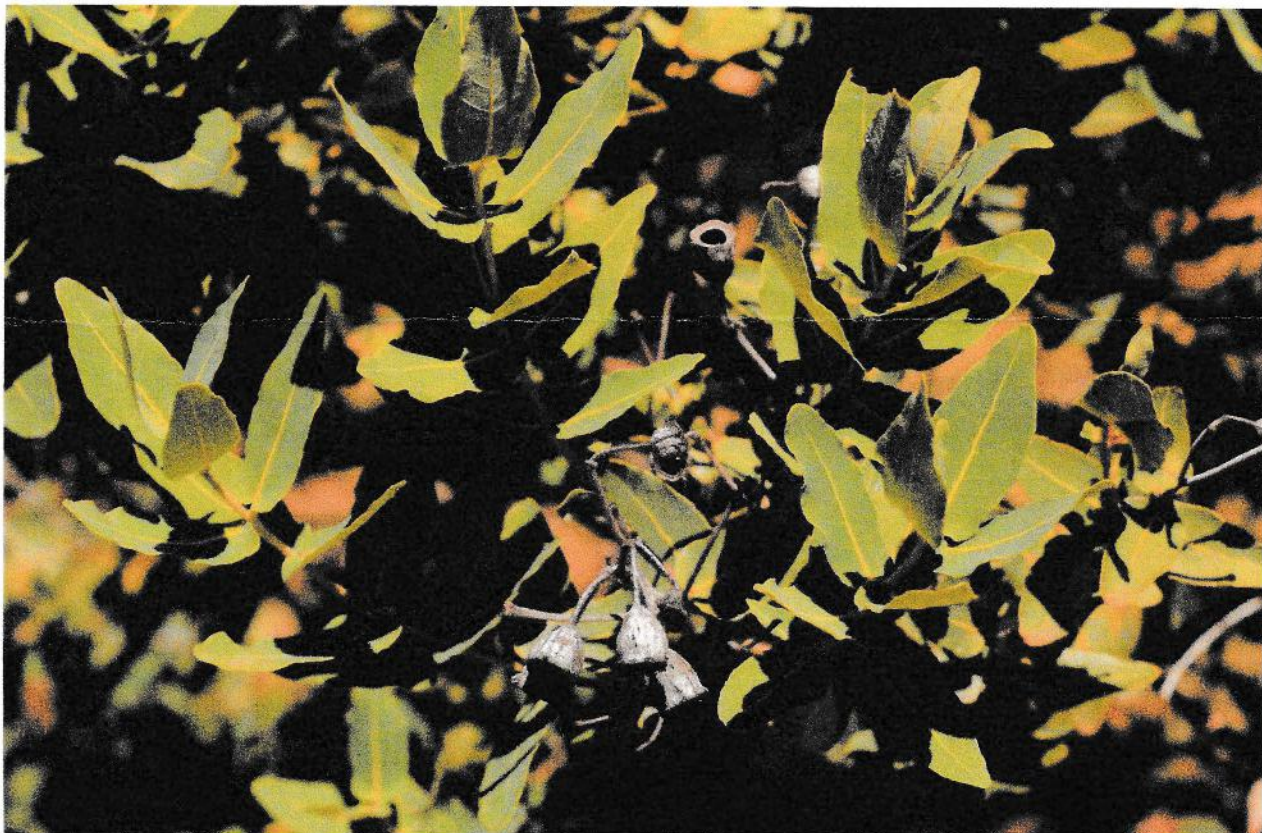
In total there are 21 specimens of *Angophora* in the Arboretum comprising 7 species and three hybrids. There is an attractive grouped planting of them just west of the watercourse near the 'Owl Pole'. Why not visit it and compare the characteristics with the nearby *Eucalyptus* species and enjoy their beauty.



Angophora costata MYRTACEAE NSW #189

Angophora hispida MYRTACEAE NSW #159A JB

Note the ribbed "gumnuts".



The Coach House Garden Laurel Crouch

A garden consists of many accumulative assets that give its own distinct character and story: the Coach House garden is no different. Some assets can come through incidental ways. For instance, a memory of a tree once standing takes on a new purpose as an abode for a succulent. Small trees cut back to their trunks become an asset as living sculptures rather than removed completely. These are two instances where this has occurred in the garden. What can be regarded as a debit becomes an invaluable asset.



Echevaria in its stump abode. LC

The stump has provided a suitable abode for a low maintenance plant and has added texture to a garden of characteristics. The 'V' shape structure left over from trees cut back provided the opportunity to create a living sculpture using a native climber. Its resemblance to the shape of a harp, although the interpretation can be in the eye of the beholder, conveys, a symbolic gesture befitting the Peter Waite legacy and how he nurtured musical talent.



Hardenbergia 'Happy Wanderer' harp taking shape. LC

The collection of assets can also come through the process of discovery. During the formative years of the Coach House Garden it came through the manual work of hand digging. It was whilst constructing the dry wall back in 2010 that more paving belonging to Peter Waite's garage was found to exist and was unearthed for full exposure.

During the years of 2012-2015, trenches were hand dug across the entire area in the effort to make soil with a total of 266 bags of horse manure added and dug several times over. It was from the labour of digging near the olive hedge at the top end in 2014 that treasure was found in the form of a horseshoe covered in clay. It was ironic, that digging a trench to add horse manure an asset from Peter Waite's era was rewarded. It also provided the boost to keep digging.

Digging an area built on clay and rubble amassed a significant collection of rocks of various sizes. Rather than seeing it as a debit it was useful for providing fill for two gabion seats for the Coach House and the Garden of Discovery gardens. An incidental recyclable resource given a new purpose above the ground.

The Coach House Garden nestles in the historical surroundings of Peter Waite's garage and horse stables. It is fortunate that these significant buildings have been retained.

The 100 year old mulberry tree takes pride and place in the midst of a young garden. A living treasure from a bygone era sharing its life with other collectable assets in the garden's progress of connecting with its past and future.



The 100 year old Mulberry tree. LC

Waite Arboretum: not just a pretty place!

Dr Jennifer Gardner OAM

Waite Arboretum is a place of tranquil beauty and treasures aplenty. There are towering trees like the Sugar Gum *Eucalyptus cladocalyx* #1201G at 35 m, the height of a 12-storey building. There are rare species endangered in the wild like the Torrey Pine *Pinus torreyana* #499A. There are trees like Tree Fuschia *Schotia brachypetala* #324 ablaze with scarlet flowers in November and a-chatter with Rainbow Lorikeets imbibing the abundant nectar. There are dense shady trees like Rusty Fig *Ficus rubiginosa* #199 with its wide-spreading canopy touching the ground creating a hidden cubby house for nature play. There are gnarled remnant trees like the Grey Box *Eucalyptus microcarpa* #1621 with hollows for possums and kookaburras and crevices for geckos and microbats.

Less apparent, but quantifiable, are the multiple ecosystem benefits the Arboretum trees deliver. Our urban forest cools the air, improves air quality, sequesters and stores carbon, and captures rainfall to avoid runoff and soil erosion.

My colleagues Marian McDuie, Arboretum Officer Erica Boyle and I have completed our research project to quantify and assign monetary values to these ecosystem services using the i-Tree Eco software and standardised field data, collected by Erica and her team of volunteers, on 1,255 specimens representing 601 species in 146 genera.

Our report¹ is available on i-Tree Eco Resources www.itreetools.org/resources/reports/WaiteArb, and the Waite Arboretum www.adelaide.edu.au/waite-historic/arboretum webpages. Quantifying these benefits has added a new perspective to our appreciation of the Arboretum trees and the urban forest more generally.

In summary, the structural value of the surveyed trees (50% of the Waite Arboretum collection) was calculated to be A\$13 million. Additional structural and functional values of the surveyed trees were:

Carbon storage: 1,167 tonnes (A\$26,600), equivalent to annual carbon emissions from 910 vehicles or 373 single-family houses;

Air pollution removal (O₃, CO, NO₂, SO₂ and particulate matter <2.5 microns): 1.2 tonnes/year (A\$4,840 / year) equivalent to annual emissions from 160 vehicles or 36 single family homes;

Carbon sequestration: 34.3 tonnes/year (A\$783/year);

Oxygen production: 91.5 tonnes/year;

Avoided runoff: >1,072 cubic metres/year (A\$2,420/year).

Especially exciting for us is that Marian has created a map, available free in ArcGIS online maps, in which selected environmental benefits of each of the 1,255 specimens surveyed are now available at the tap of a finger on. Click on the link <http://arcg.is/1iTTcY> or type 'Waite Arboretum Tree Inventory' into your favourite search engine.

A Waite Arboretum aerial image with every surveyed tree highlighted in light green with the 10 colour range reflecting the age class of the tree and labelled with the scientific name will be displayed. Click on a tree to display its environmental benefits which will also be uploaded to the Waite Arboretum App. For example: Sugar Gum #1201J

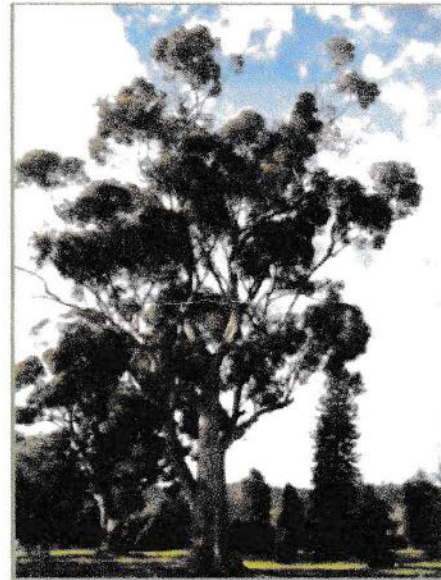


Photo: J.Gardner Arboretum Tree #1201J
Eucalyptus cladocalyx Sugar Gum Height 34 m, DBH 202 cm, Age 140 years, Carbon stored 6.2 tonne, Carbon sequestered 5.3 kg/yr, Total Pollution Removed 5.3 kg/yr, Structural Value A\$56,891.

View and explore the collection with the online map. Then download the App and visit the Arboretum on a beautiful day while the weather is pleasant. When you pause to admire a tree take a moment to appreciate its environmental benefits as well as its beauty. How fortunate we are to have this wonderful botanic jewel for our enjoyment and well-being.

¹ Gardner, J., McDuie, M. and Boyle, E. 2017 *Valuing the Waite Arboretum, South Australia An i-Tree Ecosystem Analysis*



Neutrog donates fertilisers for the Urrbrae House Gardens and the Waite Arboretum native plants.