

BUDAWANGIA*

AN E-NEWSLETTER FOR ALL THOSE INTERESTED IN THE NATIVE PLANTS OF THE NSW SOUTH COAST

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Aims: To connect those interested in the native flora of the NSW South Coast, to share up to date information on the flora of the region and to broaden the appreciation of the region's native plants.

Editorial

The past month has been mixed in terms of weather. The beginning of the month continued the very dry conditions since about March. The late part of the month saw substantial rain; some locations receiving over 250 mm during the rainfall event.

The tangle of vines often encountered in rainforest thickets throughout the region is usually a species of *Cissus* or Water Vine. The three species of *Cissus* in this region are the focus of this month's main article. John Shepherd and Vanessa Keyzer have sent in a piece on their field work on the rare tree/mallee *Eucalyptus aquatica*. The authors also describe this work in a paper in *Cunninghamia* (2014) 14: 63–76. A photograph of unusual damage to a tree branch prompted an article on Cicadas.

The fifth in the series on wetland plants is included along with the answer to the mystery weed featured in last month's newsletter.

A few gardening quotes found on the internet to get us ready for Spring next week:

"Bread feeds the body, indeed, but flowers feed also the soul." - The Koran

"Gardening adds years to your life and life to your years." – Anon

"We come from the earth, we return to the earth, and in between we garden." – Anon

"An addiction to gardening is not all bad when you consider all the other choices in life." – Cora Lea Bell

I would be pleased to receive appropriate articles, however small, on interesting observations, new discoveries, plant name changes, etc., up to two A4 pages, including some photograph. Deadline is one week before end of month.

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* *Budawangia* is a monotypic, endemic genus restricted to the Budawang Range on the western edge of the South Coast region. The genus was named by Telford in 1992; the species *Budawangia gnidioides* (Ericaceae) was previously *Rupicola gnidioides*.

The water vines, *Cissus* species

Cissus is a cosmopolitan genus of approximately 350 species of woody climbers, best represented in the tropical regions of the world. The genus is in the family Vitaceae, the grape family, along with another local climber Slender Grape *Cayratia clematidea*. The related edible grape *Vitis vinifera* has been developed over thousands of years into many varieties for eating and wine making. The fruit of the *Cissus* species are quite like a black grape. The name *Cissus* comes from the Greek *kissos* meaning ivy, no doubt referring to the climbing habit of the plants.

Cissus is represented in New South Wales by four species, three of which occur on the south coast. The plants are readily identified using the following characteristics. Firstly, all are strong woody climbers that will grow well up into the tree canopy, sometimes dominating the foliage across a stand of trees. This is very obvious in the Spotted Gum forests north of Batemans Bay, where Five-leaf Water Vine *Cissus hypoglauca* is a prominent component of the moist vine thicket rainforest below the towering eucalypts. The plants produce tendrils opposite their leaves that aid in climbing. Two species, Water Vine or Kangaroo Vine *C. antarctica* and Long-leaf Water Vine *C. sterculiifolia*, produce domatia, which are obvious on the undersides of the leaves. The photographs below leave no doubt as to the differences between the three species.



Cissus hypoglauca; the leaves are palmately compound, the leaflets are mostly in fives.



Cissus hypoglauca; showing glaucous underside of a leaflet.

Cissus hypoglauca was named in 1854 from a specimen collected near Sydney, NSW. This is the most common species of *Cissus* locally, and occurs throughout the region at all altitudes. *Cissus antarctica*, named in 1803 from a specimen from “New Holland”, is common at lower altitudes in subtropical rainforest. The least common species is *Cissus sterculiifolia*, which was named in 1887 from a specimen gathered at the Hastings River in NSW. This species grows in subtropical rainforest along the escarpments and reaches its southern limit in stands of littoral rainforest at Jervis Bay.



Cissus antarctica; the species has simple leaves and produces grape-like purple-black fruit.



Cissus antarctica; underside of the leaf showing the prominent domatia along the leaf mid-vein and a tendril.



Cissus sterculiifolia; the leaves are palmately compound, usually with five leaflets.



Cissus sterculiifolia; underside of leaflet showing prominent domatia near the central vein.

Mystery Weed Answered

Last month's weed is *Bidens pilosa* (Asteraceae), commonly known as Cobbler's Pegs or Farmer's Friend. The species is regarded as introduced; it occurs throughout Australia and in South America.

This weed is very common and found growing in disturbed areas, such as track sides, paddocks and overgrown road verges. The seed head of this species was featured in *Budawangia* No. 17. The barbed fruit is notorious for sticking to socks and clothing, hence the second common name.



Wetland Plants No. 5 – Cumbungi

Cumbungi *Typha orientalis* (Typhaceae) is a very common native wetland plant, occurring in all Australian states. The genus is cosmopolitan, with about 15 species worldwide. The species grows mainly in freshwater, where it can form dense stands, particularly below developed land where nutrient input is high. *T.orientalis* will grow in brackish water but not as vigorously as when growing in freshwater.

Below. The flowering spikes of *Typha orientalis* that appear in the warmer months.



Above. *Typha orientalis* growing in a drainage ditch at Shellharbour.

Cicadas

There are around 2000 species of cicada in the world; Australia has about 220 of these. Most species belong to the family *Cicadidae*. The deafening sound of a tree full of Cicadas in summer is as Australian as going to the beach. This rather unpleasant cacophony of thousands of Cicadas does not occur every year, for which we can be most grateful. The life cycle of the Cicada is most unusual, as are the names that generations of children have given to the common and sometimes colourful species. These names include the common species Black Prince and Green Grocer. The discarded brown skins of cicada nymphs clinging to trees, fences and the like, is a common sight in those summers when the insects emerge in great numbers.

The life cycle of the Cicadas involves three distinct stages: egg, nymph and adult. The female lays their eggs into a branch of a tree by making a slit in the bark and inserts the eggs in the slit created as she moves along the branch. A branch can become so covered in these slender slits that it completely strips off the bark; if the branch dies and dries out the eggs, if still present, will probably die.

The eggs stay in the slits in the bark for many weeks and then hatch into a miniature cicada called a nymph. Falling to the ground, these tiny nymphs dig into the soil up to half a metre, where they stay for as long as 17 years feeding on the sap of small tree roots. When the environmental conditions are right, and we do not know exactly what these conditions are, there is a massive emergence of mature nymphs that climb above the ground into trees, etc. to pupate into the familiar flying adults. This is when the trees in some forests and backyards may be covered in the brown shed skins of the nymphs.

The adult males congregate in their hundreds in a patch of trees, calling to attract the females. Below the tree, their urinating falls down like rain as they discard the water contained in the tree sap that they are feeding upon.

Right. Photograph of a eucalypt branch covered in slits made by female Cicadas laying eggs. Branch brought in by Bob Craven (Jamberoo) from a tree in his yard.

Below. The common Green Grocer Cicada emerging from its cast skin. Photograph from Wikipedia.



***Eucalyptus aquatica* - a rare tree in the Paddys River swamps, Southern Highlands**

John Shepherd, Landcare convenor and Vanessa Keyzer, Regional Landcare Facilitator

In 2008, with the support of Local Land Services SE Region, (then Hawkesbury-Nepean Catchment Management Authority), Forestry Corporation of NSW and Wingecarribee Shire Council, a group of local volunteers formed the Landcare Penrose Swamps Conservation Group (PSCG). The principal aim being to remove Radiata Pine *Pinus radiata* wildings from swamps and adjacent eucalypt woodlands in Stingray Swamp Flora Reserve. Pine wildings have been removed from about 150 hectares, preventing harm to native biodiversity, including *Eucalyptus aquatica* and other threatened species, such as the Giant Dragonfly *Petalura gigantea*). Pine wildings originate from seeds transported by wind and birds, especially Yellow-tailed Black Cockatoos, from nearby plantations. The swamps are important sources of water for the Paddys River/Wollondilly River systems, which feed into Warragamba Dam, Sydney's main water storage.

Eucalyptus aquatica (Broad-leaved Sally or Penrose Swamp Gum) (Myrtaceae) is a small tree or mallee, known only from the Penrose area in the Southern Highlands of NSW, where plants occur sporadically in swampy ground. It is listed as vulnerable in NSW and similarly by the Commonwealth. The swamps (fens) associated with *E. aquatica* are also listed as the endangered communities *Temperate Highland Peat Swamps on Sandstone* (Commonwealth) and *Montane Peatlands and Swamps* under NSW legislation.

Recent work on an unnamed swamp near Webbers Road in the Flora Reserve has highlighted several aspects of *E. aquatica* that were largely unknown. In this swamp, the distribution of 350 plants was mapped, mainly growing in clumps, and various aspects of tree morphology recorded. The trees are present in a sheltered location within a narrow altitudinal band between, 600-610 m, and mainly in a thick peat (to 4.2 m), with some trees growing on thin sandy loam. Their existence appears dependent upon a plentiful supply of fresh water, either moving through the peat or emerging from the adjacent Hawkesbury Sandstone strata at the swamp margins.



Clump of *Eucalyptus aquatica* in Stingray Swamp.

A maximum height of nine metres is recorded; in an adjacent swamp where some peat erosion has occurred, trees were found to be connected by lignotubers. Trunks are sinuous, producing long strips of shedding bark and generally grow through a dense carpet of swamp plants. Flowering is late January to early February. Other high altitude eucalypts at the margins of the swamps include *E pauciflora* and *E ovata*.



Leaves, buds and fruit of *E. aquatica*.



Lignotuber of *E. aquatica*, growing with *Lomandra longifolia*.

So far *Eucalyptus aquatica* is only recorded from the Paddys River Wetlands and assuming that it was possibly once more widespread, it is only surviving in the sheltered swamps. The palaeobotany of *E. aquatica* is speculative until further work on the peat is undertaken, but it is likely to date from at least the Pliocene epoch (4-5M years ago). It may have flourished through the global ice ages that occurred as the Australian plate moved northwards, becoming cooler and drying out before warming up relatively recently (10,000 years) in the Holocene. Consequently, swamp studies may be very useful in analysing past climate changes and determining how these swamps formed.

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