

Reading the leaves: From the Rainforest to the Red Centre

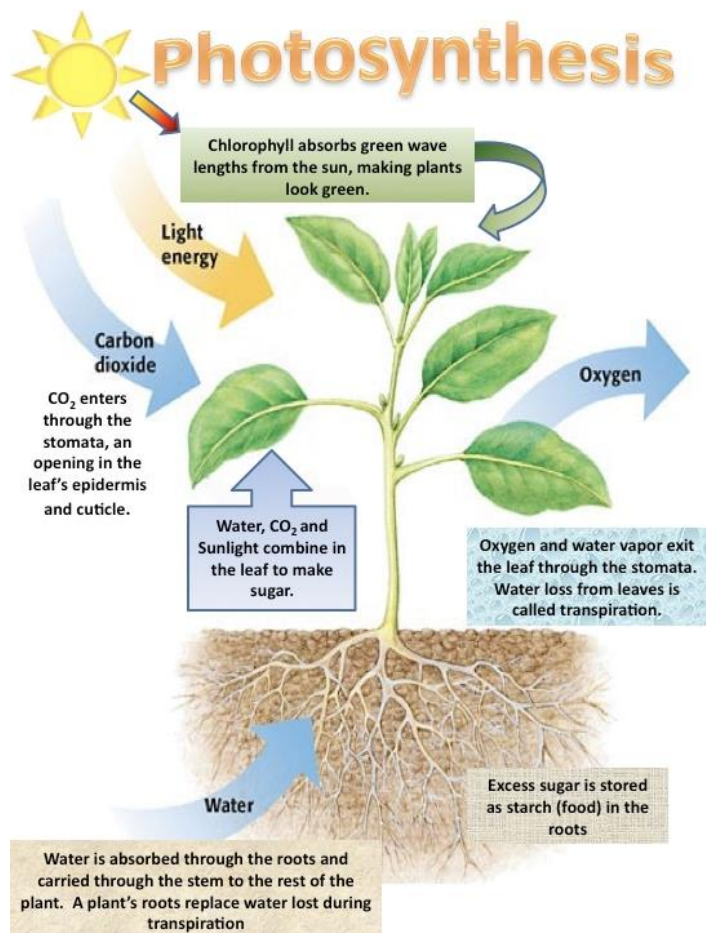
Alternative route for the conference

Walk starts by the casuarina pond on the Crosbie Morrison lawn



Leaves: Collect sunlight
 Collect CO₂
 Lose water

Juggling these in a changing environment is a constant compromise



Stop 1: At start of walk

Look around at the variety of leaves visible:
Different colours and shades of green
Different sizes and shapes

Plants have evolved since dinosaur times because the climate changed.

In hotter and drier conditions, how might a leaf adapt?

- Waxy surface
- Hairs under leaves
- Pale coloring
- Smaller thinner
- Dropping of leaves
- Orientation/edge
- Water Collecting
- Salt coating



Stop 2 - bottom of RF gully between Tasmanian and cafe bridges

If more than 4-5 in group, talk at top of steps and pause for everyone to feel the mosses etc. as we go through



During the times of dinosaurs, plants were simple because there was plenty of water, sun and carbon dioxide

Mosses & Liverworts:

No true leaves

No vascular system

No true roots



Stop 3 - edge of RF gully on the road opposite the corner of the café



200 million years – 100 million years ago Australia was covered in rainforest vegetation - Gondwana

What environmental changes are obvious as we come to the rain forest?

More water in the air

Lots of shade/lower temp – so the leaves need sun

So leaves climbed & faced upwards...

Leaves are elongated to allow water to drip off (to avoid fungus)

Leaves are very green to maximise sunlight collection

Broad surface area to maximise exposure to light

Leaves can be more succulent (more water in the air means less water loss from leaves)



Birds' Nest Fern COLLECTS water because it has no root system
Also mention spores on leaves – another use of leaves



Cunjevoi – rainforest fringe – a bit drier
So we see waxy leaves, thick cuticle, sunken stomata...



Stop 4 – road behind buildings (leading to the Pryor tree)



As we leave the rainforest and water becomes less available, flowering plants evolved as spores required water to spread. Leaves changed too.

Drier air, brighter light...

Leaves need to conserve water

Harder surfaces

Smaller surface area

Paler colours

Hairs



Correa alba – resistant to salt spray



Banksia spinulosa



Philotheca myoporoides 'Moon Shadow' – cultivar developed for attractive leaves

Stop 5 - Eremophila garden



Climate is hotter and drier, so leaves need to conserve water, but they are not short of sunshine
Pale leaves to reflect sunshine
Smaller leaves to avoid water loss
Hairy to prevent water loss

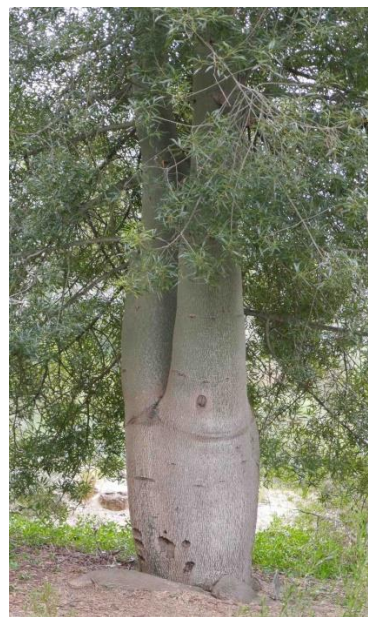
Eremophila splendens



Eremophila leaves

- Used medicinally by the aborigines, e.g.
- Used as antiseptic, for colds and flu, joint pain, headaches, antidiarrhoea
- One of the few plants which the Aborigines often dried and stored, carrying the leaves with them in case of need
- Being investigated for antibacterial qualities and use in biomedicine

Eremophila maculata



Qld bottle tree – green trunk - chlorophyll

Stop 6 - Asteraceae garden



Different shapes, colours etc. in same genus

Olearia argophylla – wet forests and rainforest fringes



Leuchochrysum albicans – grassland and eucalypt woodlands



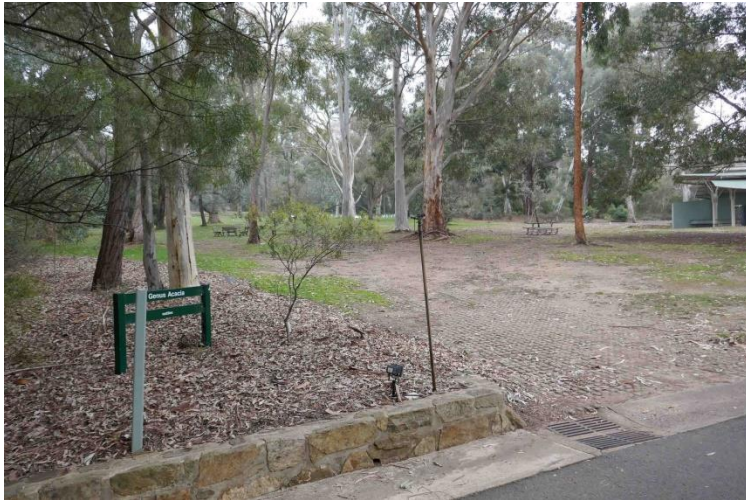
Xerochrysum viscosum – grassland, open eucalypt woodland or sclerophyll forest



Calocephalus - open situations of woodlands and grassland



Stop 7 - just off the main path where it leaves the Acacia section and enters the Eucalyptus lawn



Acacia

- Many have phyllodes (flattened leaf stalks) not leaves
- Phyllodes function like leaves, i.e. photosynthesis
- But have no vascular tissue
- Reduced water loss due to less surface area
- Lower surface to volume ratio reduces the amount of heat absorbed compared to that of standard flat leaves



Eucalyptus

- Orientation
- Texture: leathery
- Leaves can be dropped in heat waves



Stop 8 - red centre garden entrance



Established 2012 to showcase plants found in a 500km radius of Alice Springs (5 habitats)

Triodia

- Leaves are inrolled - the sharp tips project outwards acting as a deterrent to grazing animals
- Roots develop from the same nodes as the shoots, so that each stem has its own private boreline down to any possible water
- Leaf blades contain little chlorophyll contain silica – a response to grazing
- Spinifexes with straight leaf blades fold these together during the first period of drought, thus lessening their exposure to the drying air
- Some leaves are resinous on the surface – used by aborigines as a source of gum, or resin, e.g. to fix spear heads in place



Calandrinia

- Succulent leaves store water



Saltbush

- Semi-succulent leaves

Solanum centrale – bush tomato



Ptilotus macrocephalus – small leaves

