

# Reading the Leaves: From the Rainforest to the Red Centre



# Photosynthesis



Green chlorophyll absorbs energy from the sun

Light energy

Carbon dioxide

Oxygen

CO<sub>2</sub> enters through the stomata, an opening in the leaf's epidermis and cuticle.

Water, CO<sub>2</sub> and Sunlight combine in the leaf to make sugar.

Oxygen and water vapor exit the leaf through the stomata. Water loss from leaves is called transpiration.

Water

Excess sugar is stored as starch (food) in the roots

Water is absorbed through the roots and carried through the stem to the rest of the plant. A plant's roots replace water lost during transpiration

## Leaves:

Collect sunlight

Collect CO<sub>2</sub>

Lose water

Juggling these in a changing environment, is a constant compromise

# Stop 1: Visitors' Centre

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

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 colouring

Smaller thinner

Dropping of leaves

Orientation/edge

Water Collecting

Salt coating

## Stop 2: Sir Joseph Banks Bust



# Stop 3: Rainforest Gully

What environmental changes are obvious as you walk into 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

# Stop 4: Gondwanaland Sign

200 million years – 100 million years ago Australia was covered in Rainforest vegetation



Look for:

- \*climbers,
- \*elongated leaves,
- \*the bright green colour,
- \*the leaves are more succulent (more water in the air means less water loss from leaves)

Birds' Nest Fern COLLECTS water because it has no root system

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

# Stop 5: Rainforest Fringe Plants Section 110

Drier air, brighter light...



Leaves need to conserve water



Waxy leaves, thick cuticle, sunken stomata...

# Stop 6: Asteraceae Garden



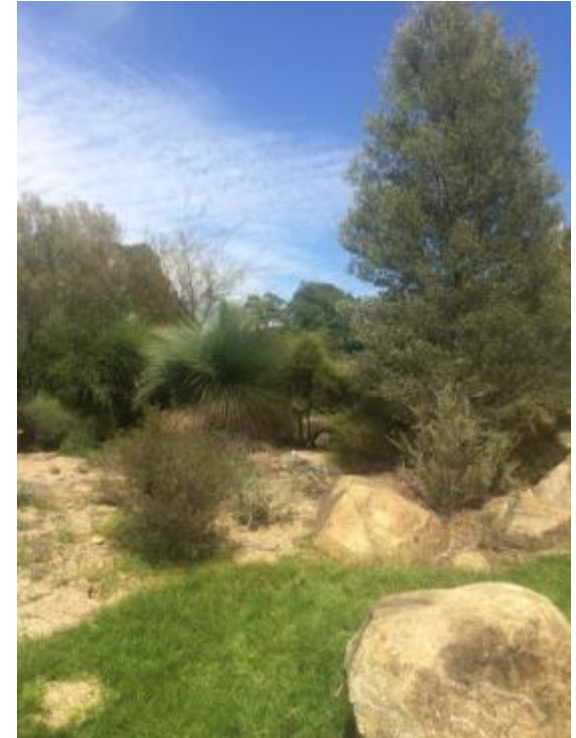
Leucophyta (leuco = white;  
phyta = plant)

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

The Australian White Cedar (*Melia azedarach*) is one of only a couple of fully deciduous trees native to Australia



Xanthorrhoea (means 'yellow flow' due to yellow resin); 30 species found in Australia from Dry Central to Marginal Rain Forest



# Stop 7: Eucalypt Lawn



Orientation

Texture: leathery

Leaves can be dropped in heat waves

# Stop 8:

## The Red Centre

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



Bush Tomato  
(*Solanum orbiculatum*)

Heat bank provided by rock



*Atriplex vesicaria* — may not be dead...



Mount Connor Wattle  
(*Acacia ammobia*)

Salt Bush (*Ragodia spinescens*)



# Stop 9: Viewing Platform of Red Centre



5 habitats: scarp lands, saltbush plains, dunes, mulga scrublands, dry riverbeds

# Thank you

