



# Xerophytes



## **Xerophytes**

Xerophytes are plants that are adapted in such a way that they are able to tolerate extended periods of dry conditions. Most water lost from plants is in the form of water vapour that diffuses out of the leaves through the stomata during the process of transpiration. Transpiration may also take place through the cuticle. The plant cannot stop all loss of water vapour as this would prevent diffusion of oxygen & carbon dioxide during respiration and photosynthesis. The following characteristics are typical of xerophytic plants and help to prevent moisture loss and to store available water:

### **Roots:**

- ◆ Large capacity for storing water.
- ◆ Deep taproots.
- ◆ Wide-spreading roots near the soil surface.
- ◆ They are able to spread widely in search of sources of fresh water.

### **Leaves**

The leaf is the part of the plant where the greatest amount of transpiration takes place. A xerophytic plant may have any of the following leaf characteristics to help reduce transpiration while still being able to photosynthesise:

- ◆ Thick, waxy cuticle – reflective and reduces evaporation.
- ◆ White and shiny – reflective and reduces evaporation.
- ◆ Smaller surface area – limits area of transpiration.
- ◆ Fewer number – less leaves to transpire.
- ◆ Densely packed.
- ◆ Stop growing during the dry season – greater moisture conservation.
- ◆ Rolled – to reduce leaf area exposure.
- ◆ May be covered with a layer of light-coloured hairs or thorns. These act as a wind break, produce small shadows on the surface of the plant which cools it, trap humid air and are a light-reflecting surface.



Prickly Saltwort

## **Succulent stems**

- ◆ The structure of the stems is more fleshy and spongy to help store water.

## **Stomata**

- ◆ Located in pits and grooves and increase humidity in the air currents around the stomata.
- ◆ Located on the underside of the leaf to limit exposure to heat.
- ◆ Located on the inside of a rolled leaf to create humidity and reduces exposure to air currents. The rolled leaf also exposes less surface area.
- ◆ Fewer stomata to reduce transpiration.
- ◆ Closed during the day. They open at night and photosynthesis can still take place as a result of the change in a chemical process within the plant (Crassulacean Acid Metabolism).

## **More supporting tissues (fibres)**

- ◆ Strengthen the plant so that if it begins to wilt through lack of water it won't completely collapse.

## **Movement**

- ◆ Move away from the light to avoid surface exposure to the sun.

## **Reproduction**

- ◆ The plants can be dormant for years until the right moisture conditions occur and then they can complete their whole reproductive cycle in a few days.

Some sand dune plants also have the ability to adapt to fast changing levels of sand.



**Sea Rocket**