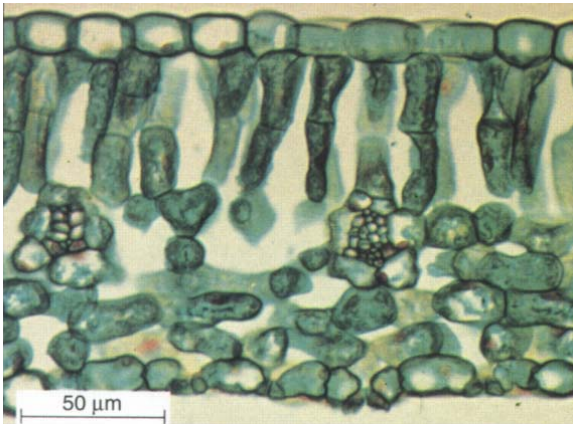
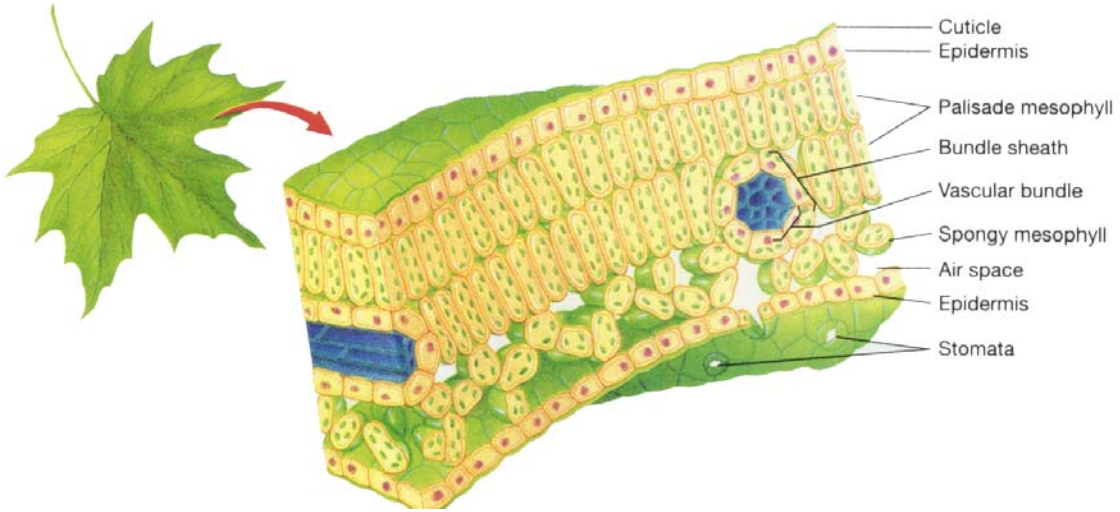
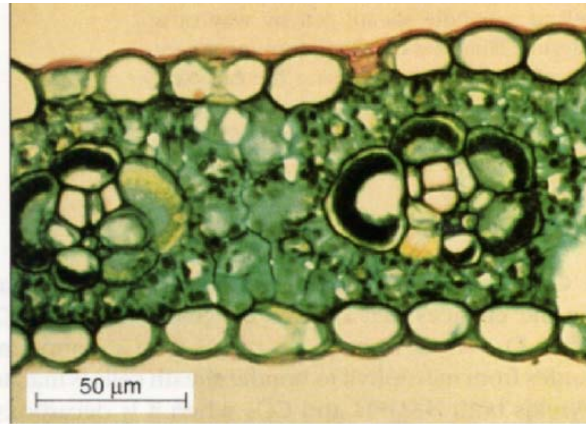


## Leaf Structure Illustrations

### Dicot Leaf Structure

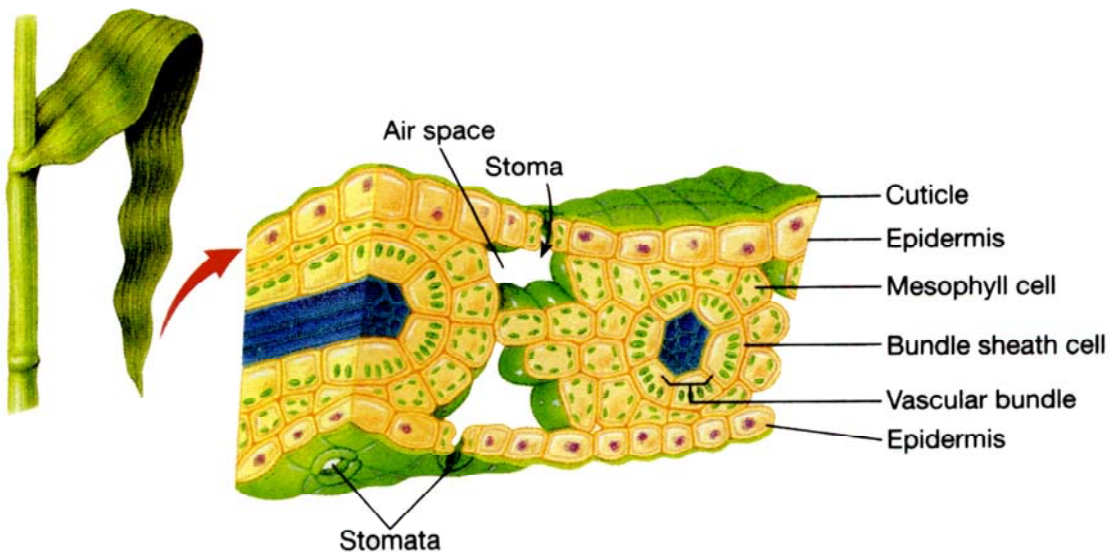


Dicot Leaf, *Syringa*, Cross Section



Monocot Leaf, *Zea*, Cross Section

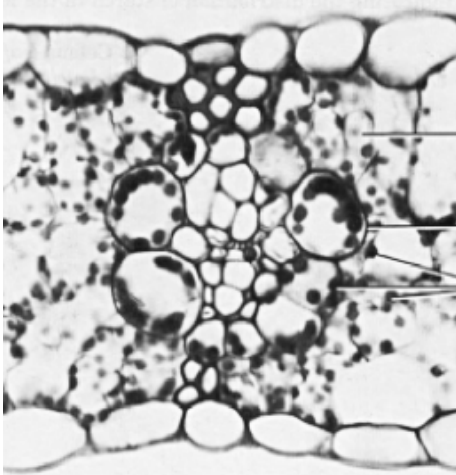
### Monocot Leaf Structure



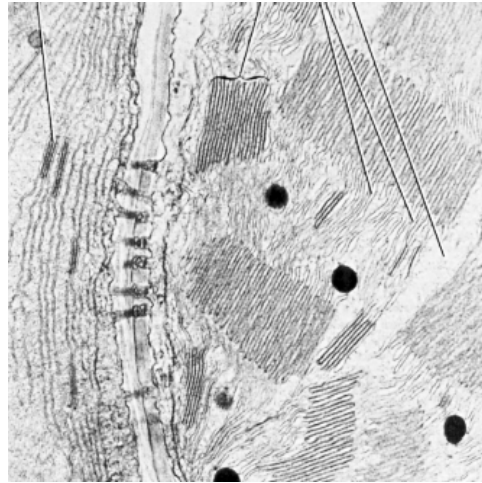
### C-4 Leaf Structure

Observe the micrographs of the C-4 mesophyll and bundle sheath cell chloroplasts shown below. Note the different chloroplast structures in the two cells. Why does the mesophyll cell have chloroplasts containing lots of grana composed of many thylakoid layers? Why are well-developed grana absent in the chloroplasts of the bundle sheath cell?

Note the many plasmodesmata that connect the two cells shown in the electron micrograph. Why would you expect to see so many plasmodesmata between the mesophyll cells and the bundle sheath cells in the C-4 plant?

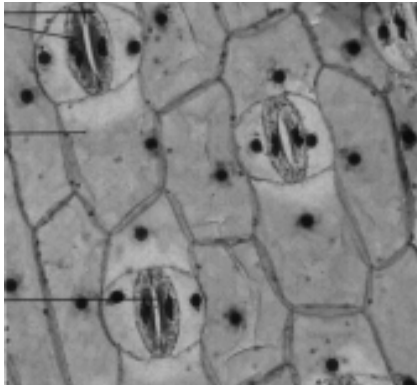


Corn leaf, *Zea*, xs

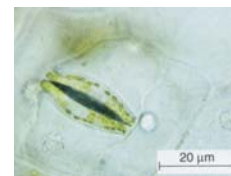
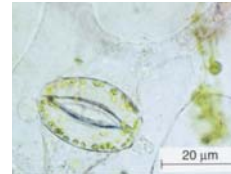


Chloroplasts from bundle sheath cell (left) and mesophyll cell (right) of corn leaf.

### Stomata Structure



Leaf epidermis with stomata and guard cells

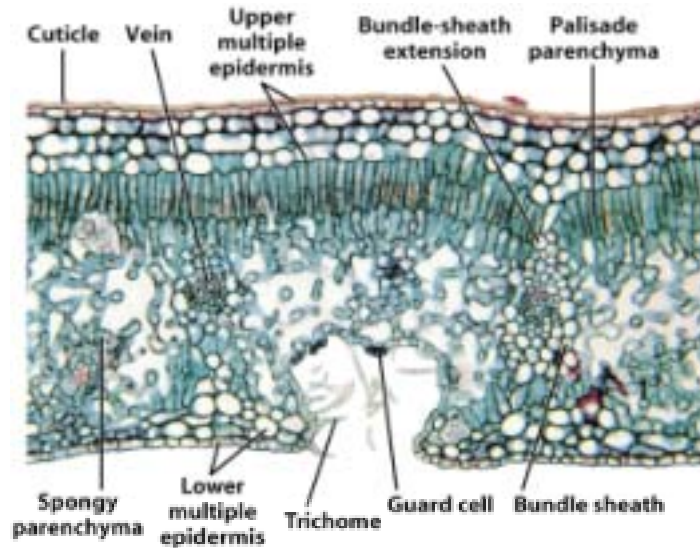


Open and Closed Stomata

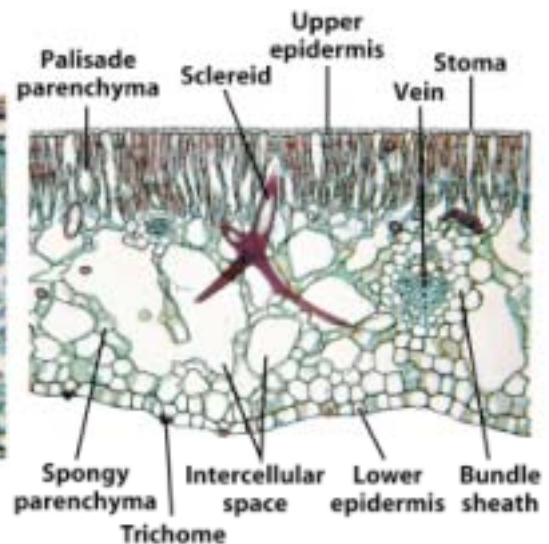
## Environmental Adaptations of Leaves

### Xeromorphic Leaves

Plants that live in arid environments are subject to drought, and often, intense sunlight. Such plants are called xerophytes. Many xeromorphic plants have a number of modifications that help minimize water loss from the plant surfaces. Examine a slide of *Nerium oleander*, a xeromorphic shrub.



*Nerium oleander* – Xeromorphic Leaf



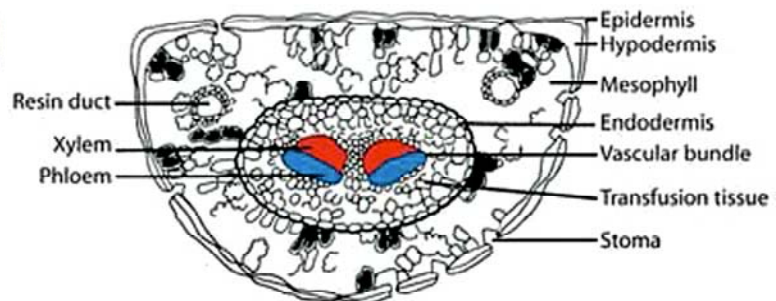
*Nymphaea* (Water Lily) – Hydromorphic Leaf

### Hydromorphic Leaves

The leaves of the water lily (*Nymphaea*) float on the surface of ponds and lakes, although the water lily is rooted in the lake bottom. Examine a prepared slide of *Nymphaea* leaf to observe modifications water lilies have for flotation.

### Conifer Needles

Many conifers live in areas of cold winters and dry summers. The conifer needle also has many xeromorphic adaptations. Examine the prepared slide of Pine leaf and compare its adaptations for drought with the Oleander leaf.



Pine Leaf (Needle)