

Leaves

- The leaf
 - Is the main photosynthetic organ of most vascular plants

- Leaves generally consist of
 - A flattened **blade** 葉身 and a stalk
 - The **petiole** 葉柄, which joins the leaf to a node of the stem

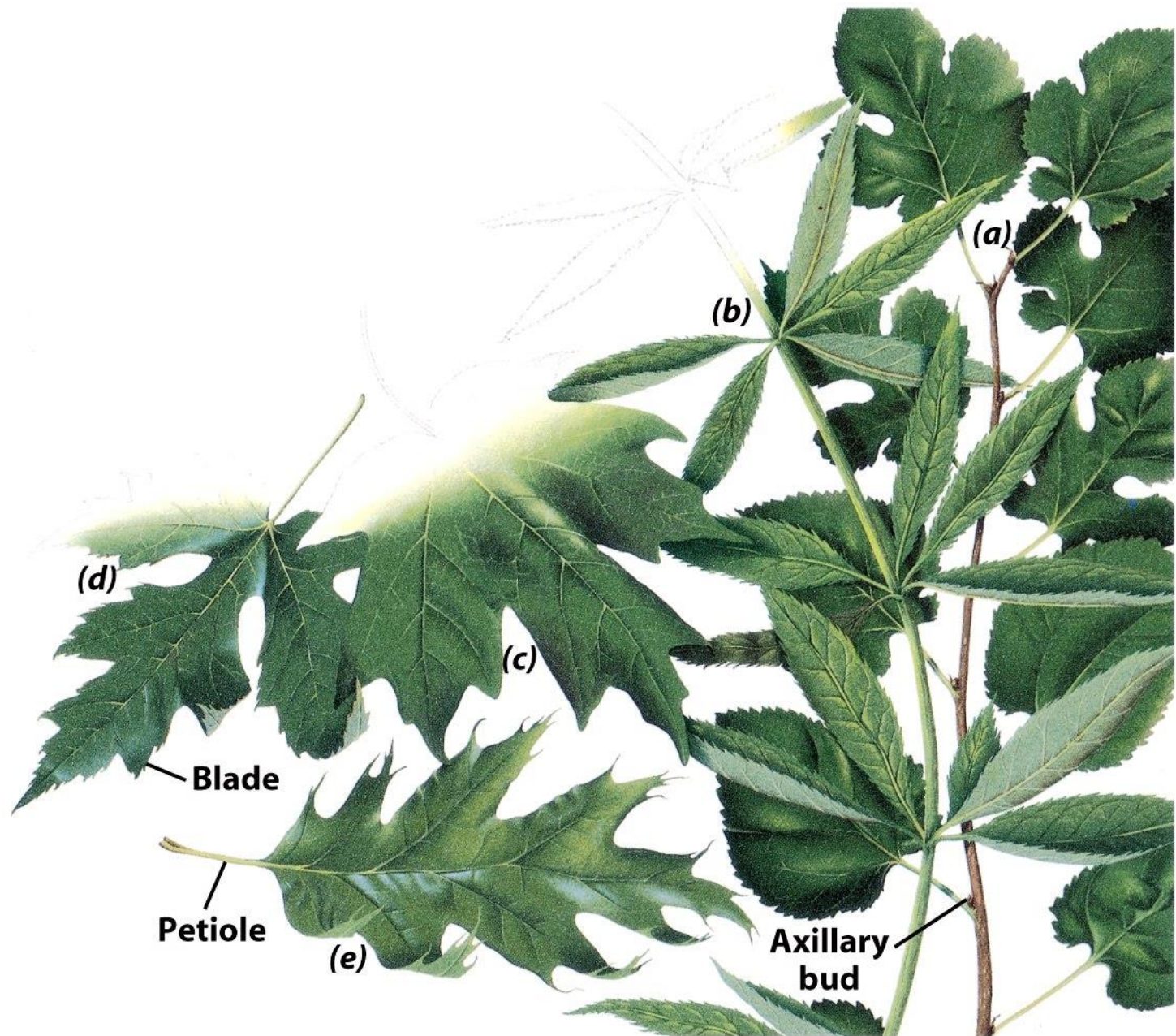


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- In classifying angiosperms
 - Taxonomists may use leaf morphology as a criterion

(a) **Simple leaf.** A simple leaf is a single, undivided blade. Some simple leaves are deeply lobed, as in an oak leaf.

(b) **Compound leaf.** In a compound leaf, the blade consists of multiple leaflets. Notice that a leaflet has no axillary bud at its base.

(c) **Doubly compound leaf.** In a doubly compound leaf, each leaflet is divided into smaller leaflets.

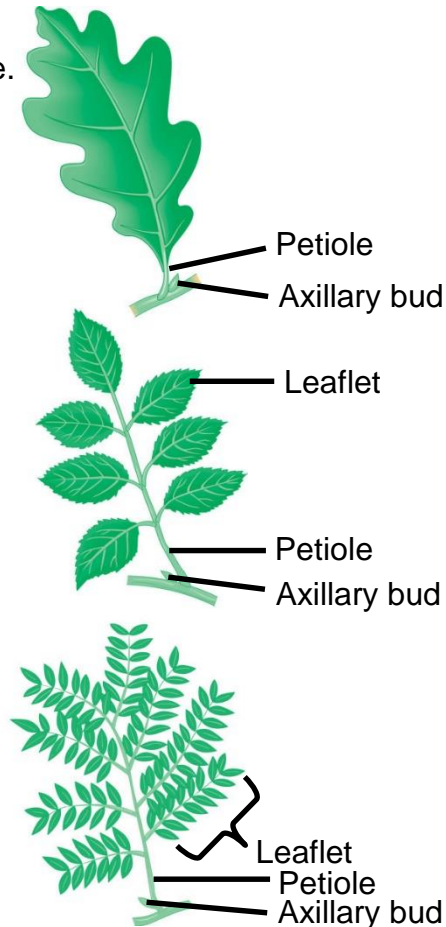


Figure 35.6a–c

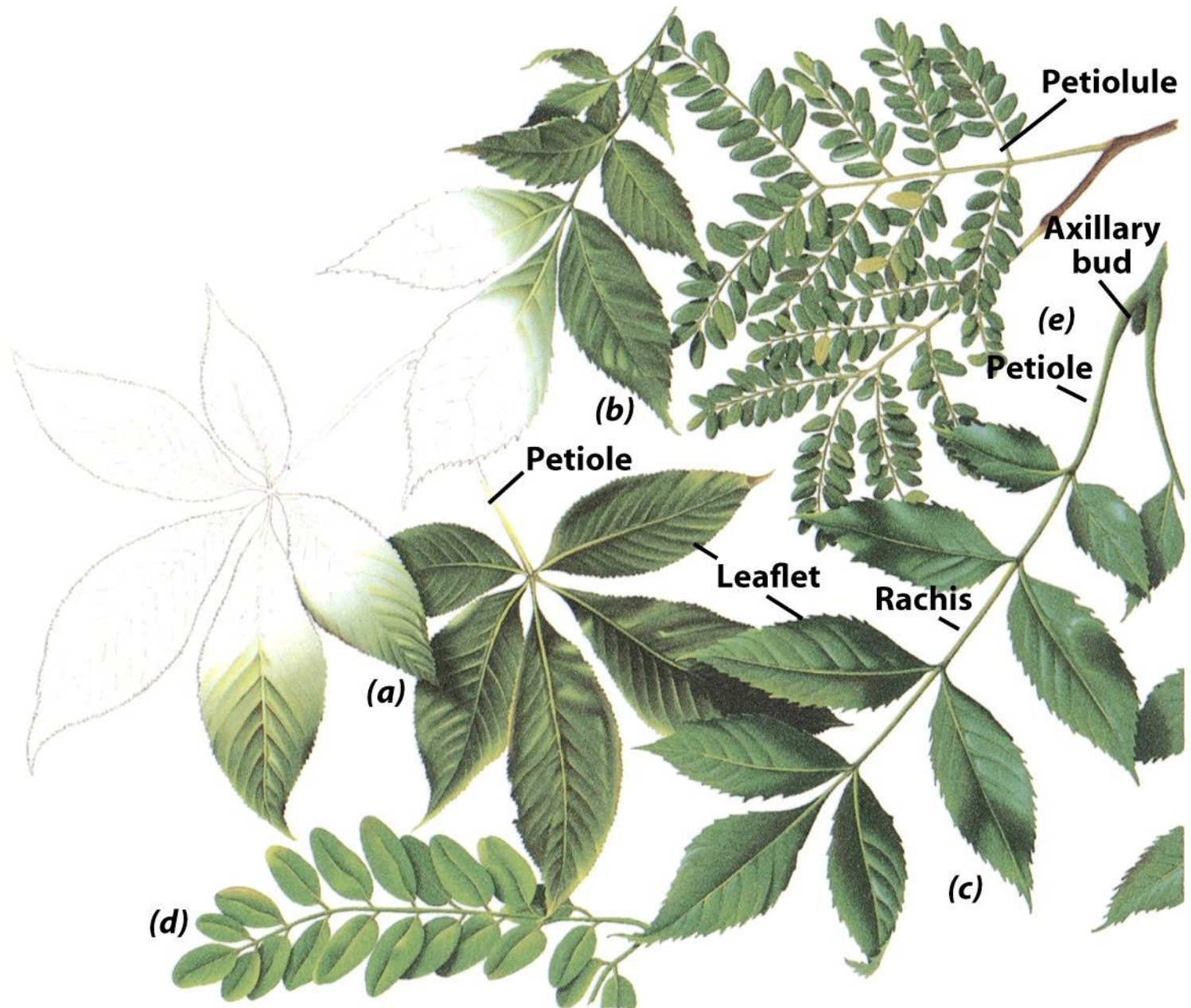


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- Some plant species
 - Have evolved modified leaves that serve various functions

(a) **Tendrils.** The tendrils by which this pea plant clings to a support are modified leaves. After it has “lassoed” a support, a tendril forms a coil that brings the plant closer to the support. Tendrils are typically modified leaves, but some tendrils are modified stems, as in grapevines.



(b) **Spines.** The spines of cacti, such as this prickly pear, are actually leaves, and photosynthesis is carried out mainly by the fleshy green stems.

(c) **Storage leaves.** Most succulents, such as this ice plant, have leaves modified for storing water.



(d) **Bracts.** Red parts of the poinsettia are often mistaken for petals but are actually modified leaves called bracts that surround a group of flowers. Such brightly colored leaves attract pollinators.

(e) **Reproductive leaves.** The leaves of some succulents, such as *Kalanchoe daigremontiana*, produce adventitious plantlets, which fall off the leaf and take root in the soil.



Figure 35.6a–e



Figure 25-17
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Figure 25-18a
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Figure 25-18b
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- Monocots and dicots
 - Differ in the arrangement of veins, the vascular tissue of leaves
- Most monocots
 - Have parallel veins
- Most dicots
 - Have branching veins

Tissue Organization of Leaves

- The epidermal barrier in leaves
 - Is interrupted by stomata, which allow CO₂ exchange between the surrounding air and the photosynthetic cells within a leaf
- The ground tissue in a leaf
 - Is sandwiched between the upper and lower epidermis
- The vascular tissue of each leaf
 - Is continuous with the vascular tissue of the stem

• Leaf anatomy

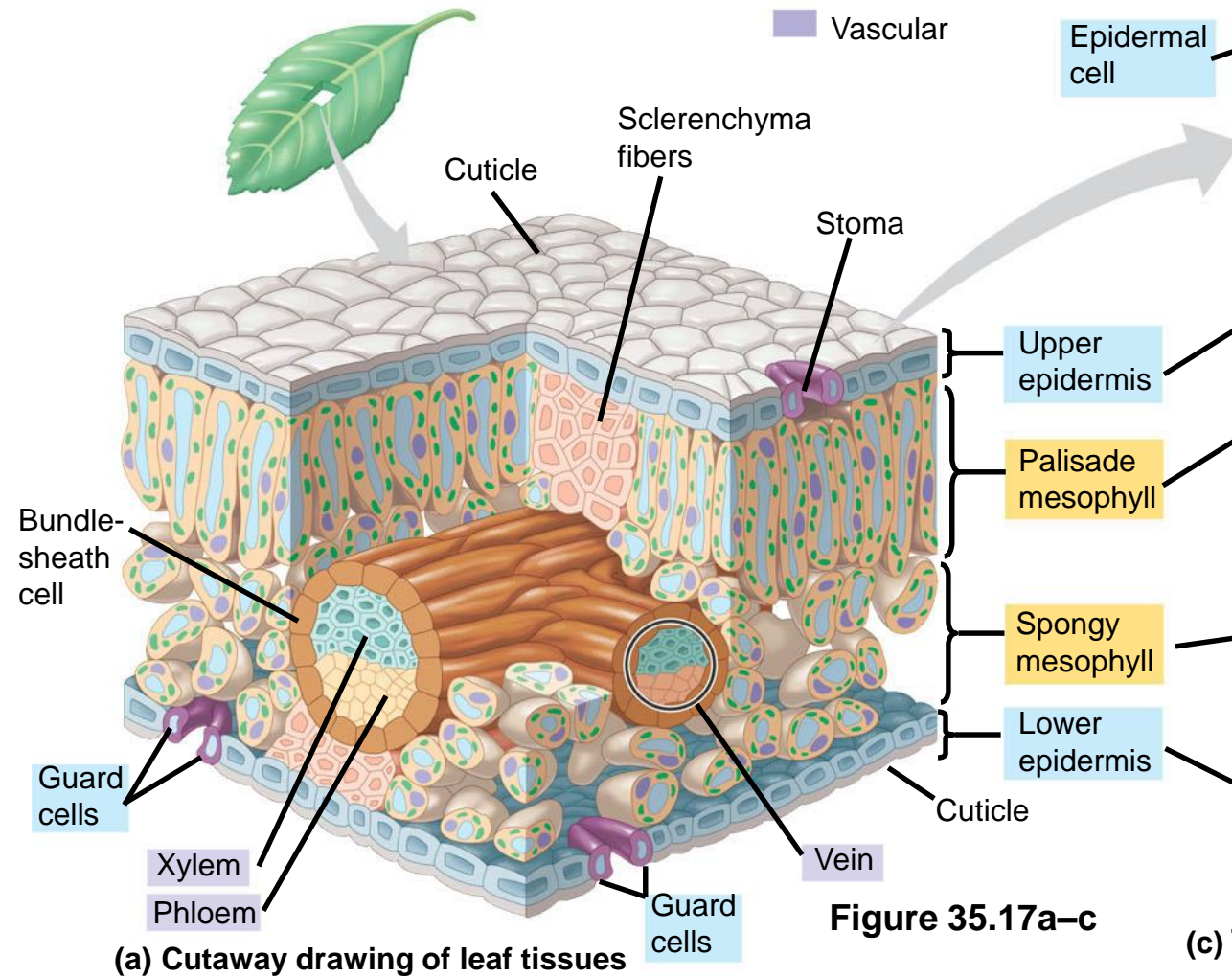
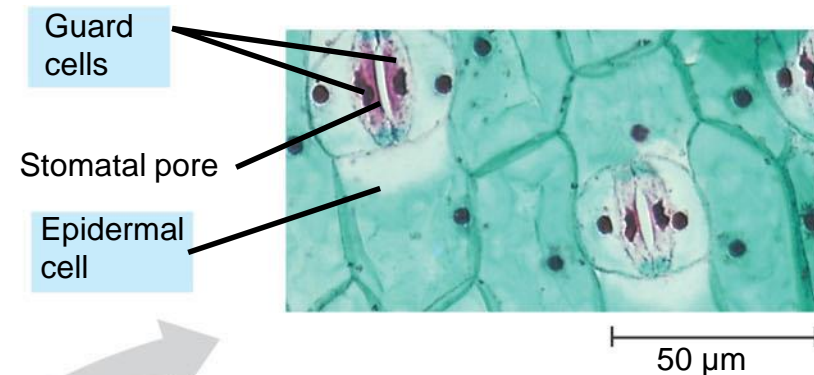
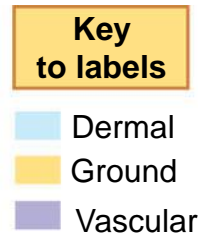
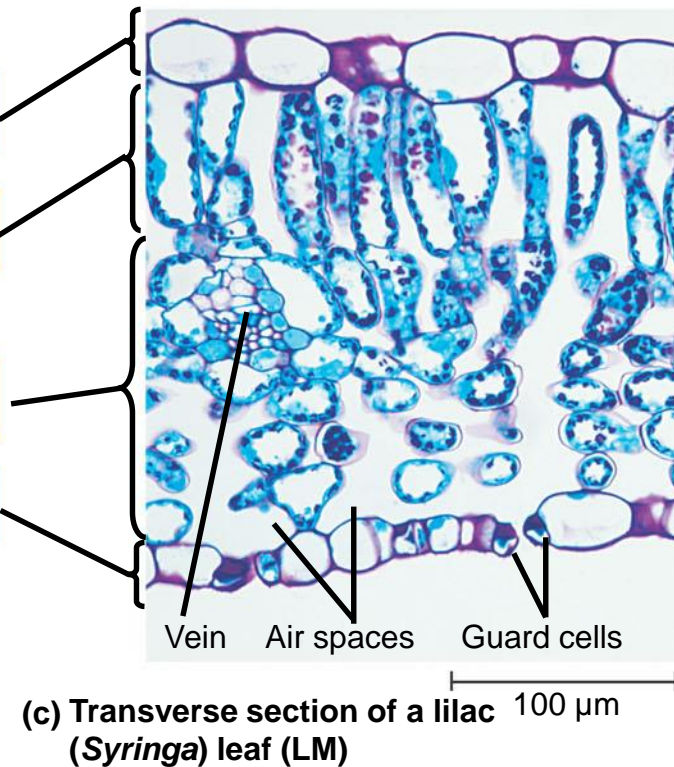


Figure 35.17a–c

(b) Surface view of a spiderwort (*Tradescantia*) leaf (LM)



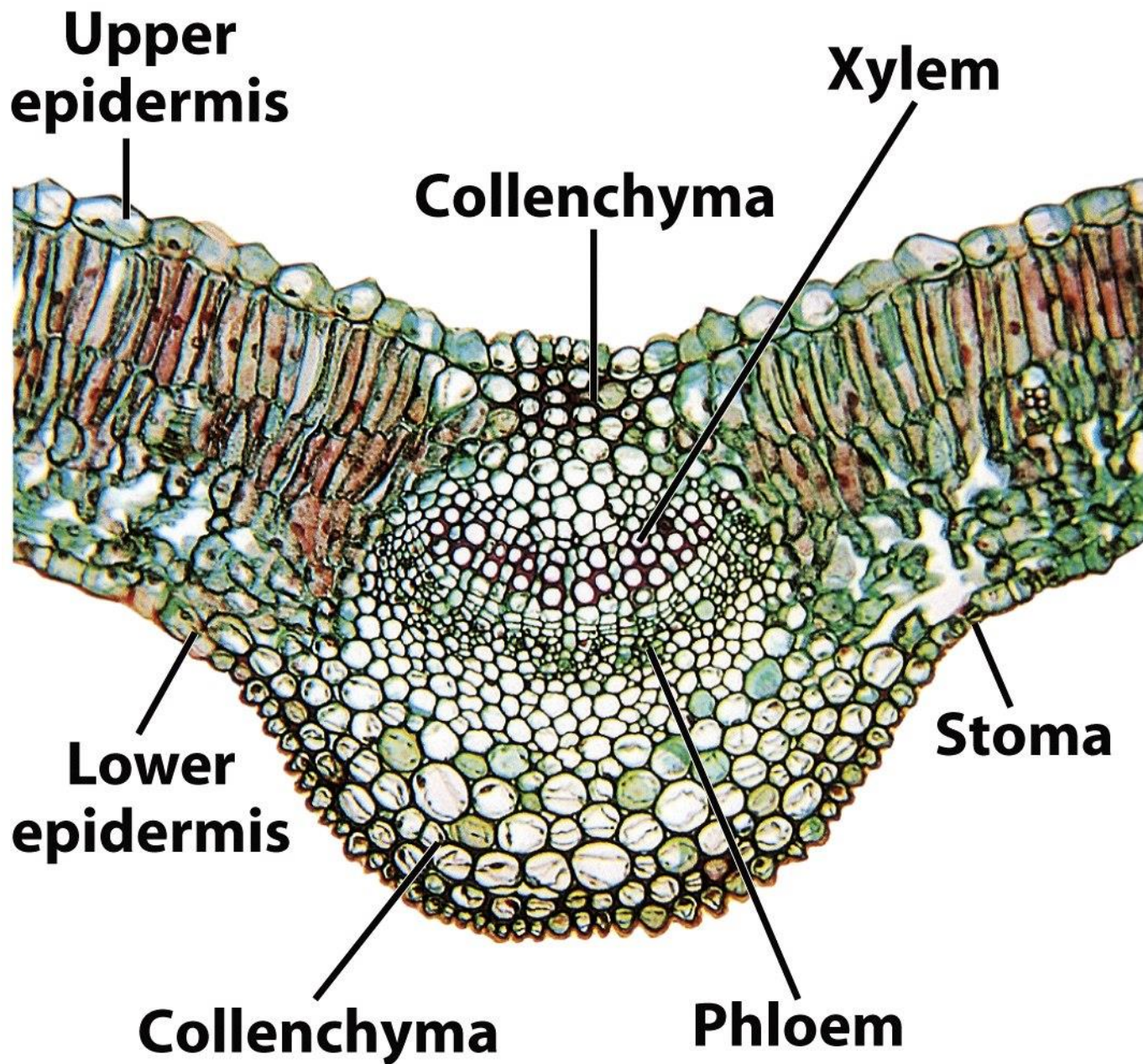


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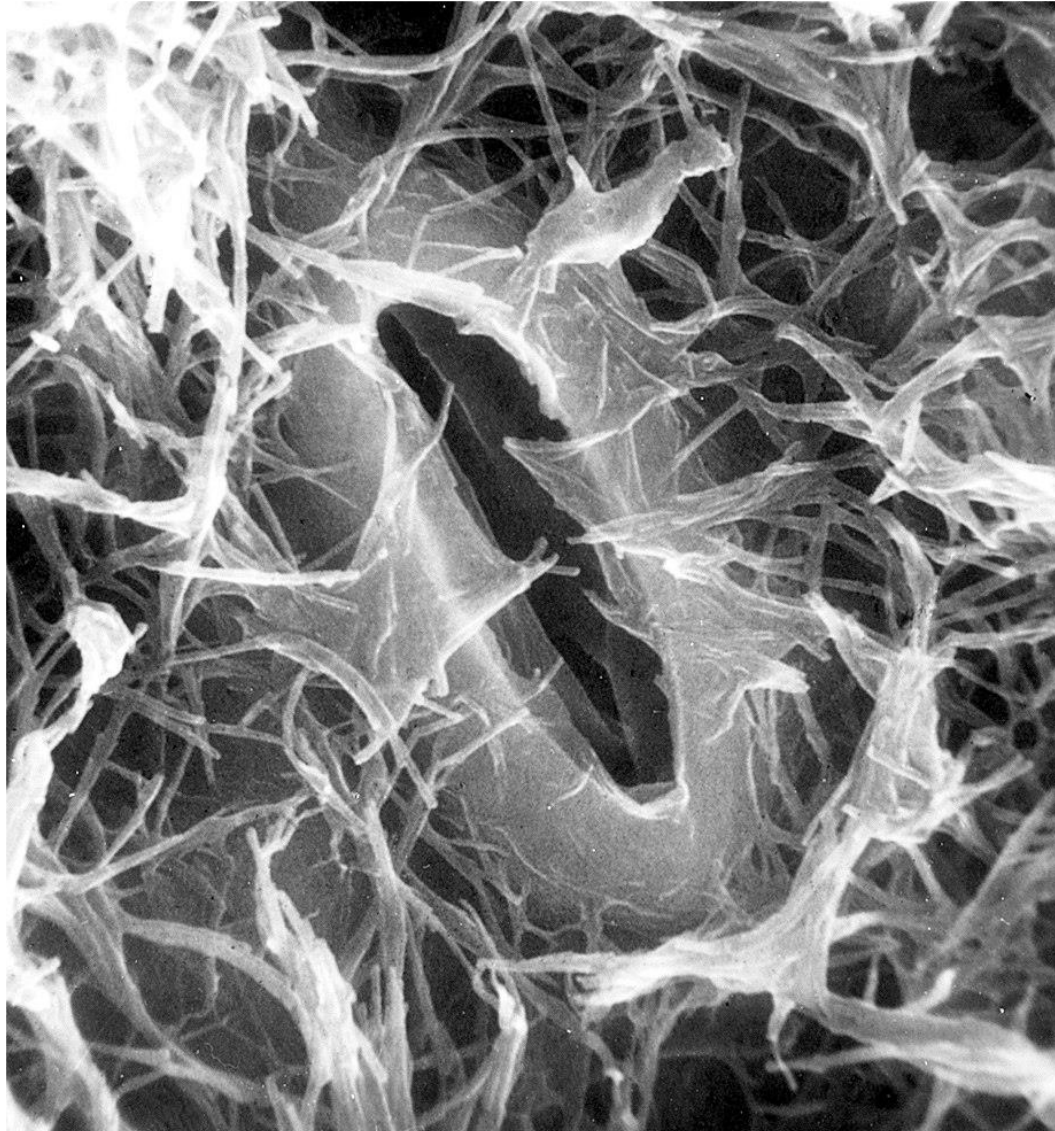
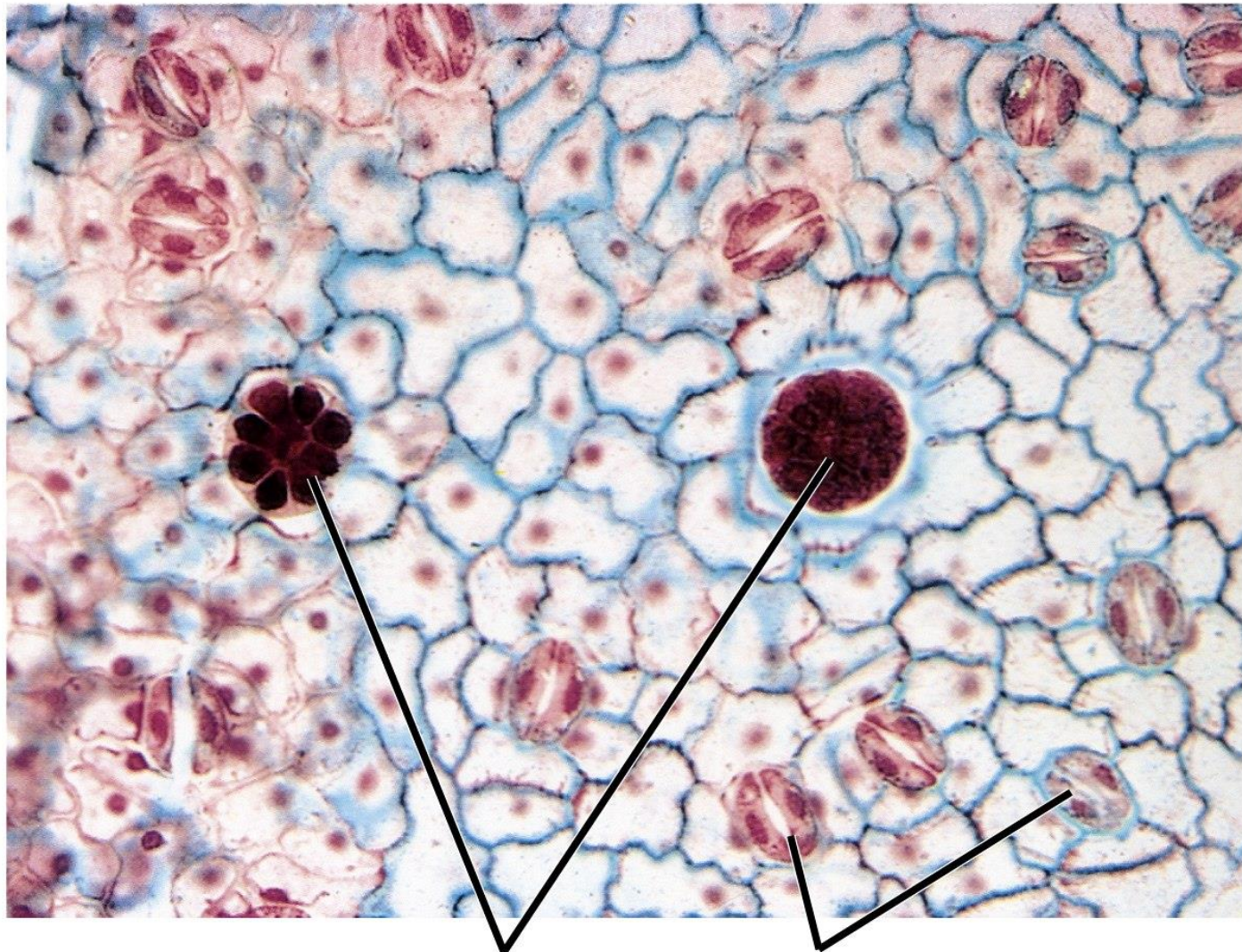


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Trichomes

Stomata

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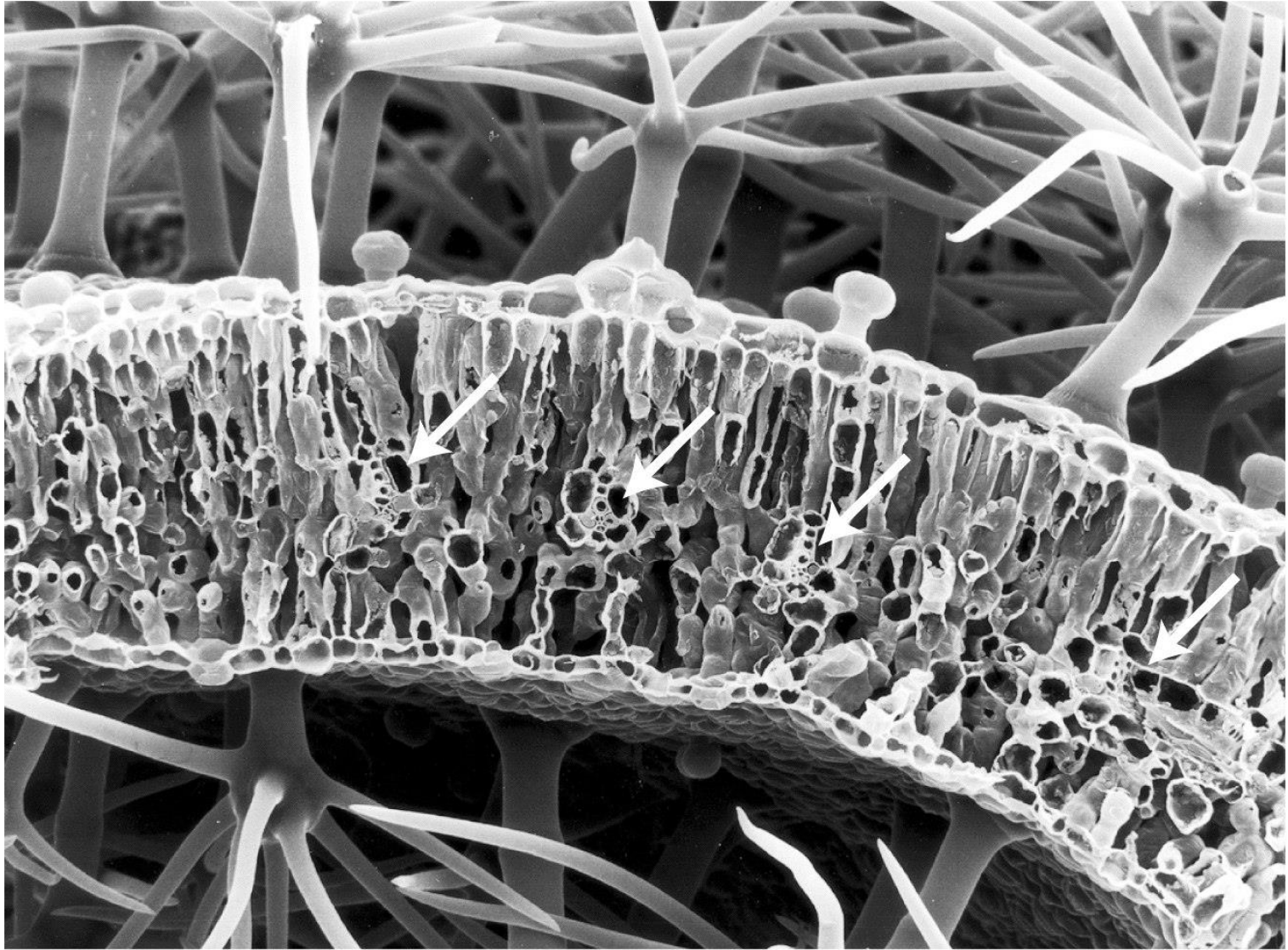


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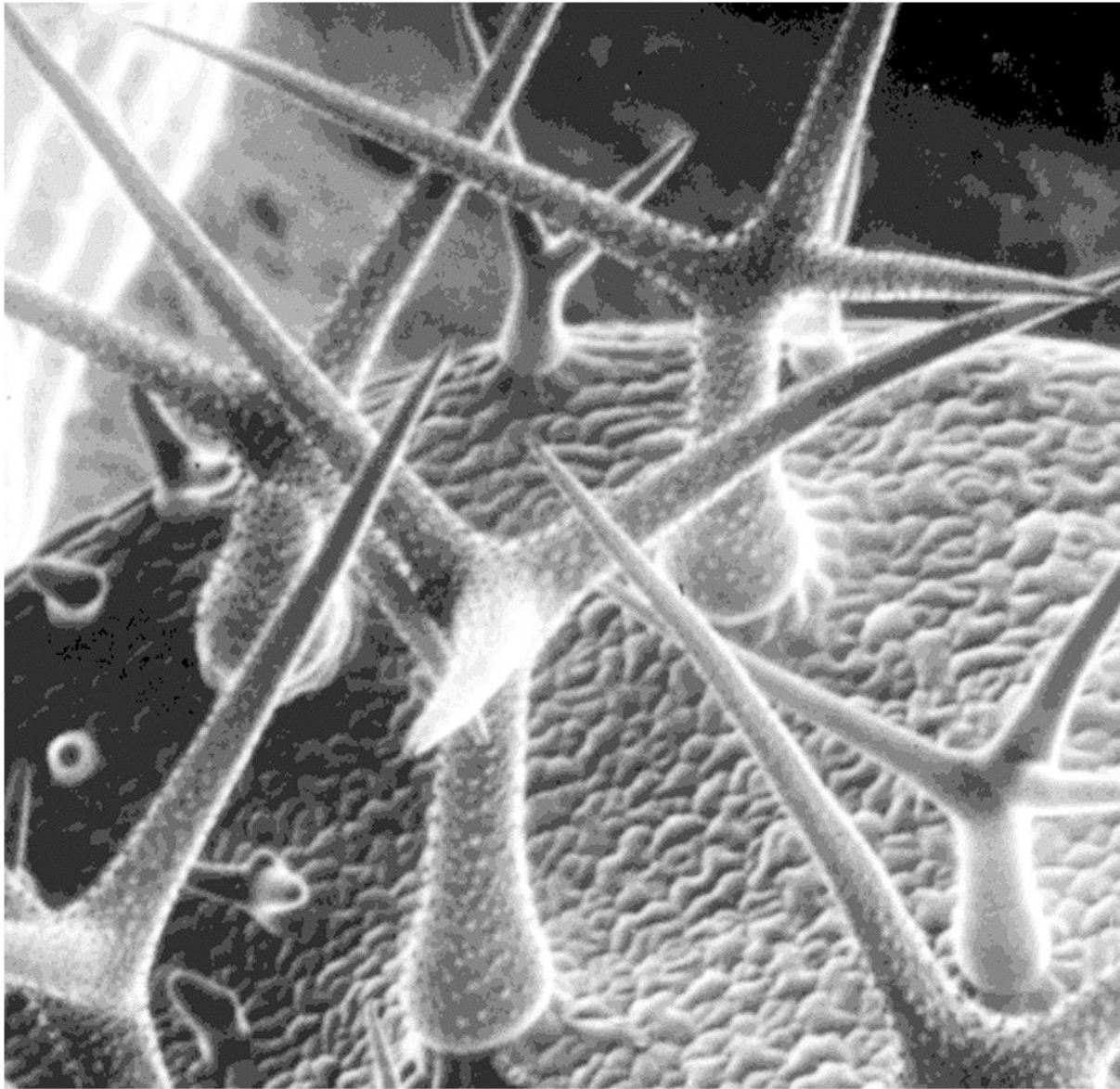


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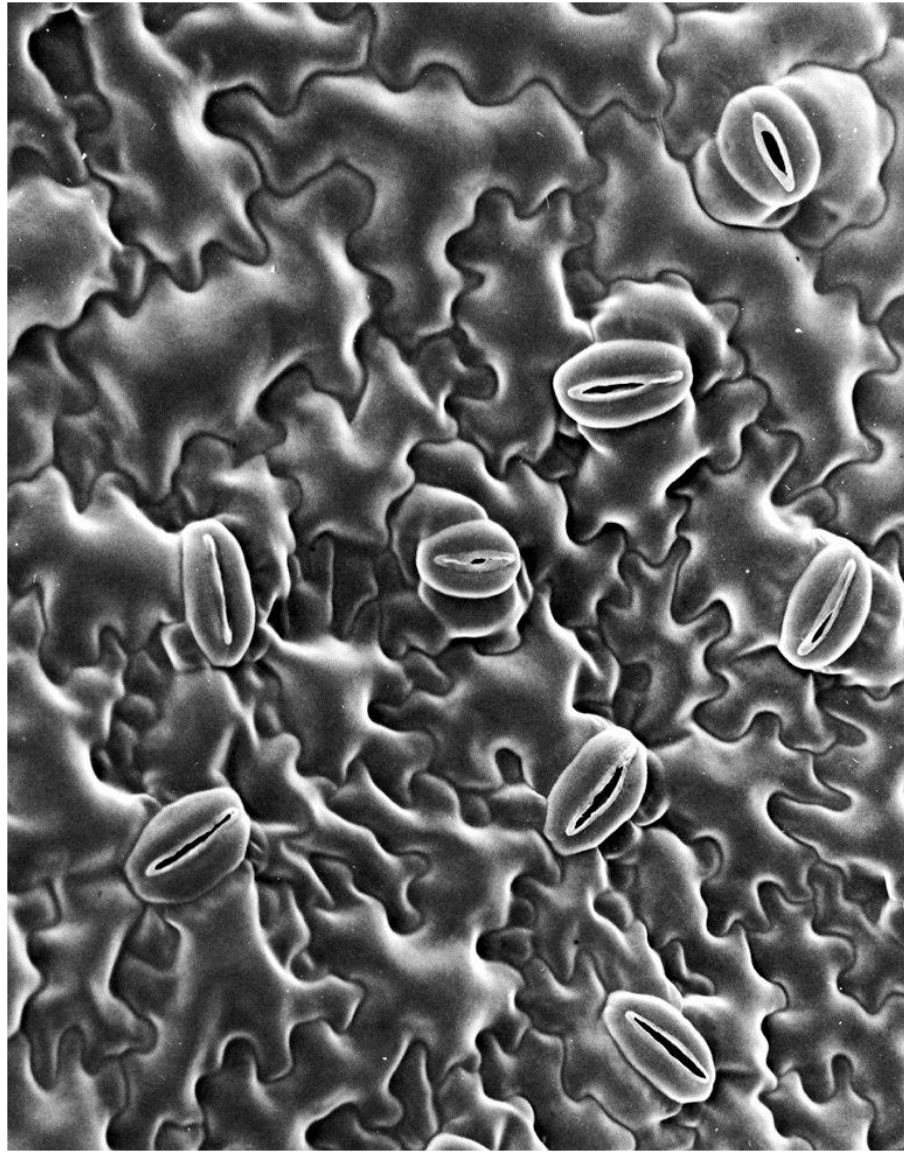


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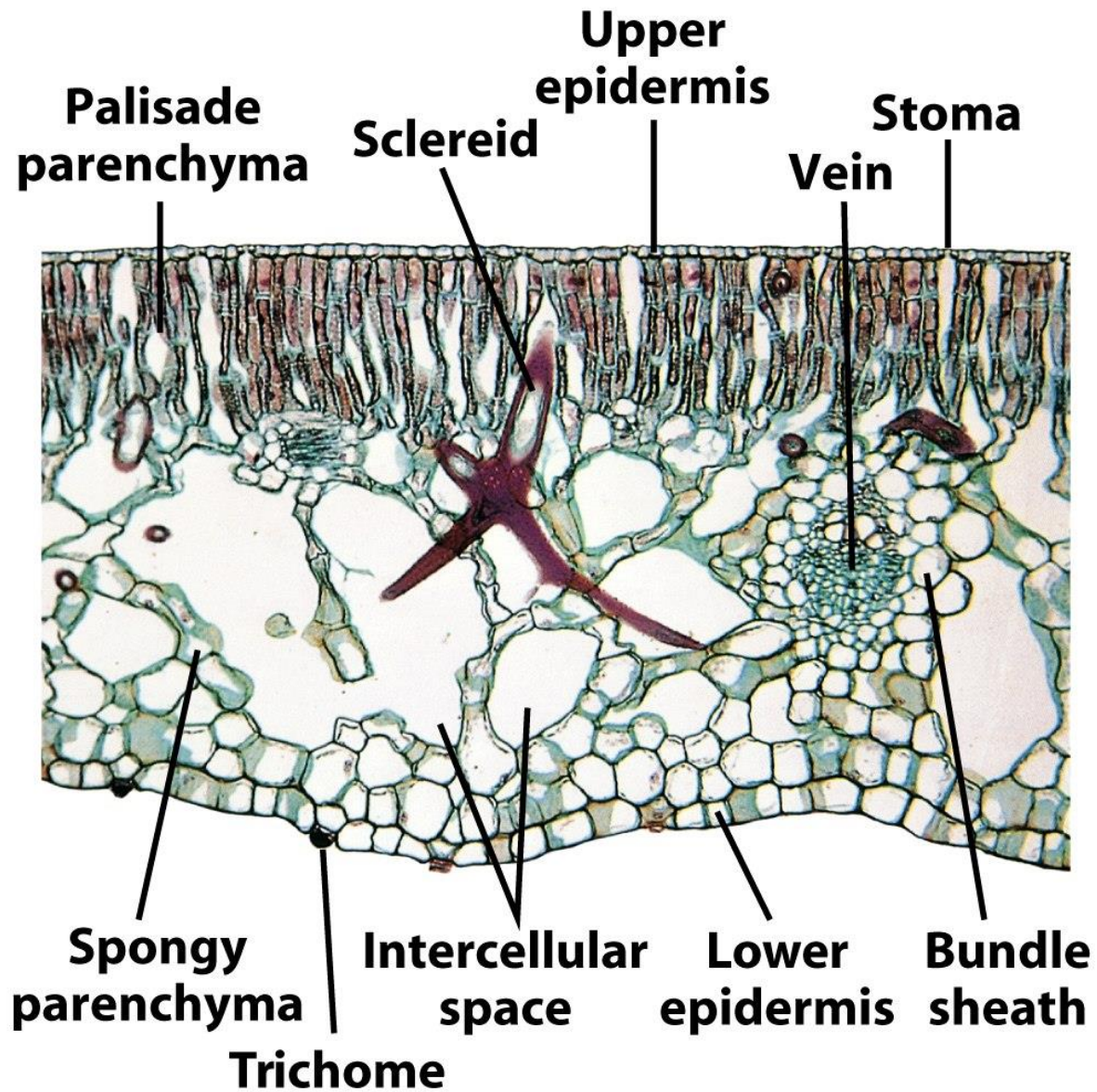


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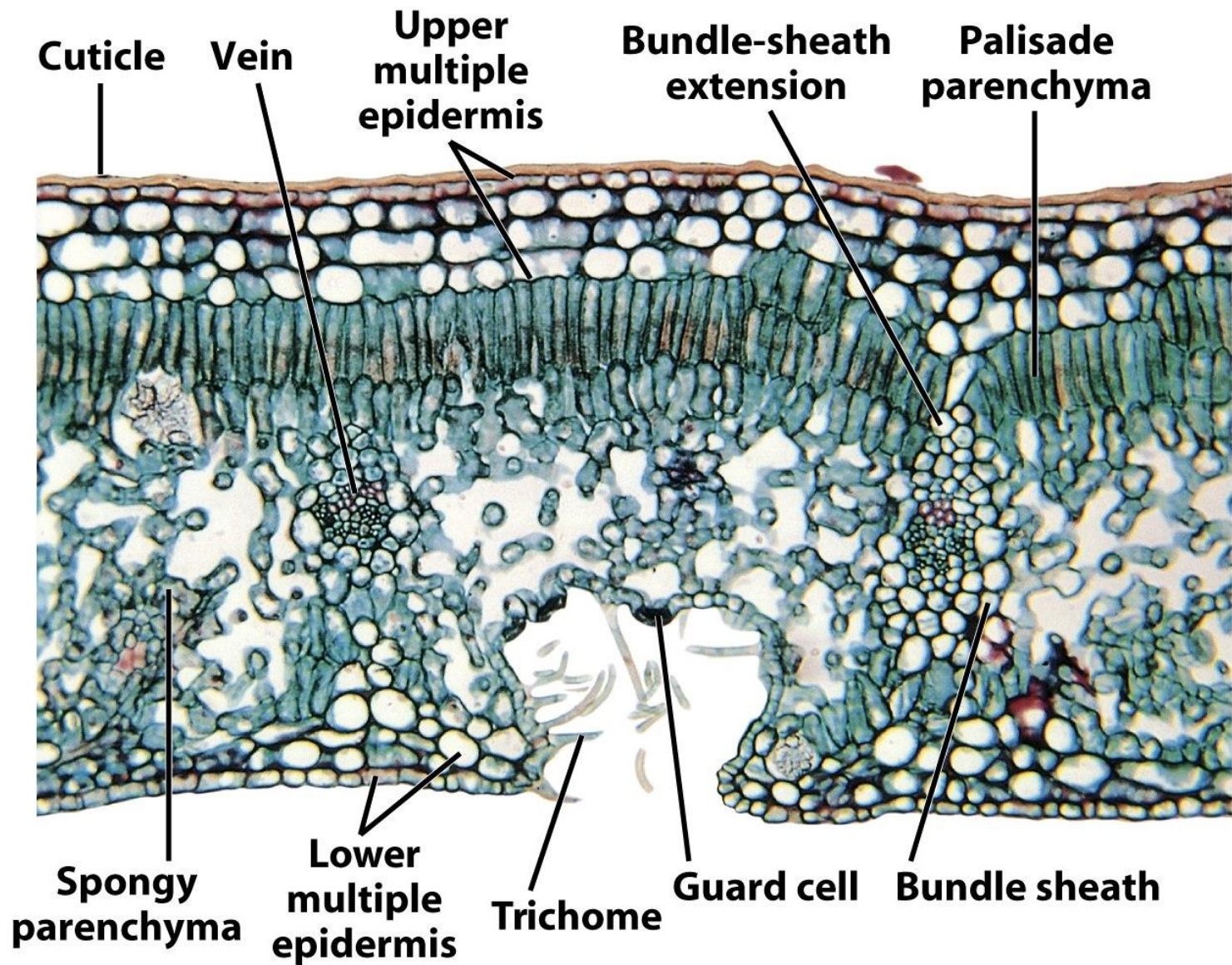


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- The most obvious morphological changes
 - Typically occur in leaf size and shape

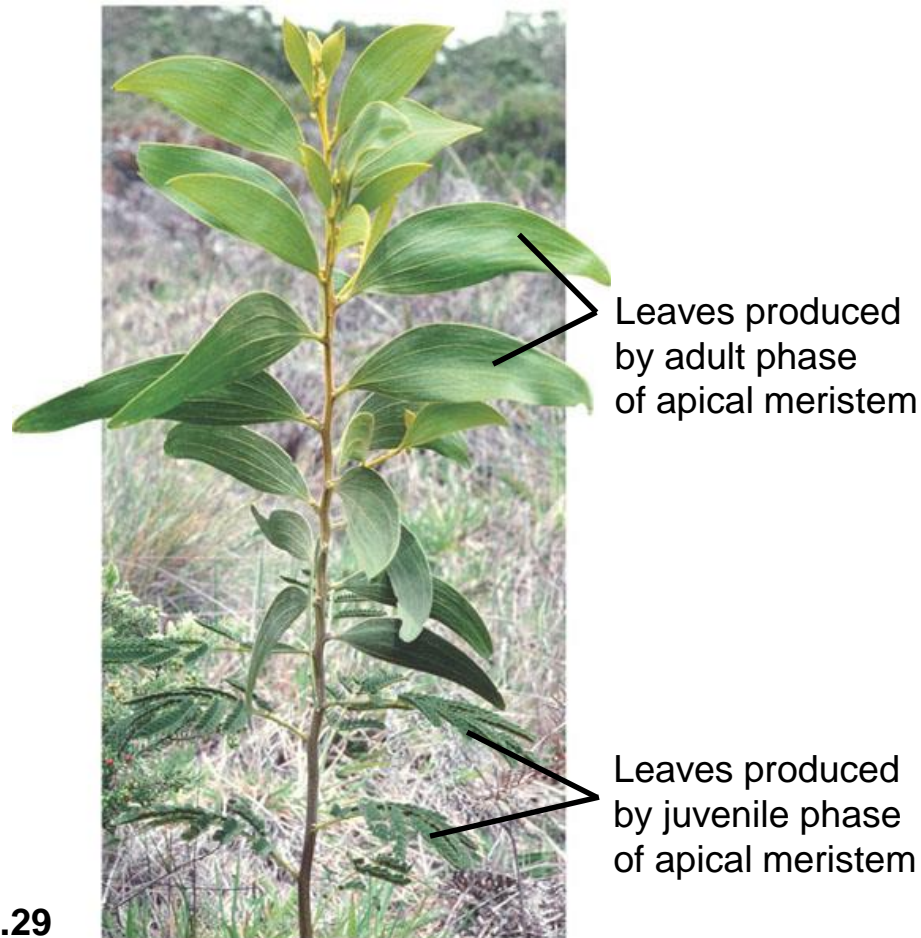


Figure 35.29

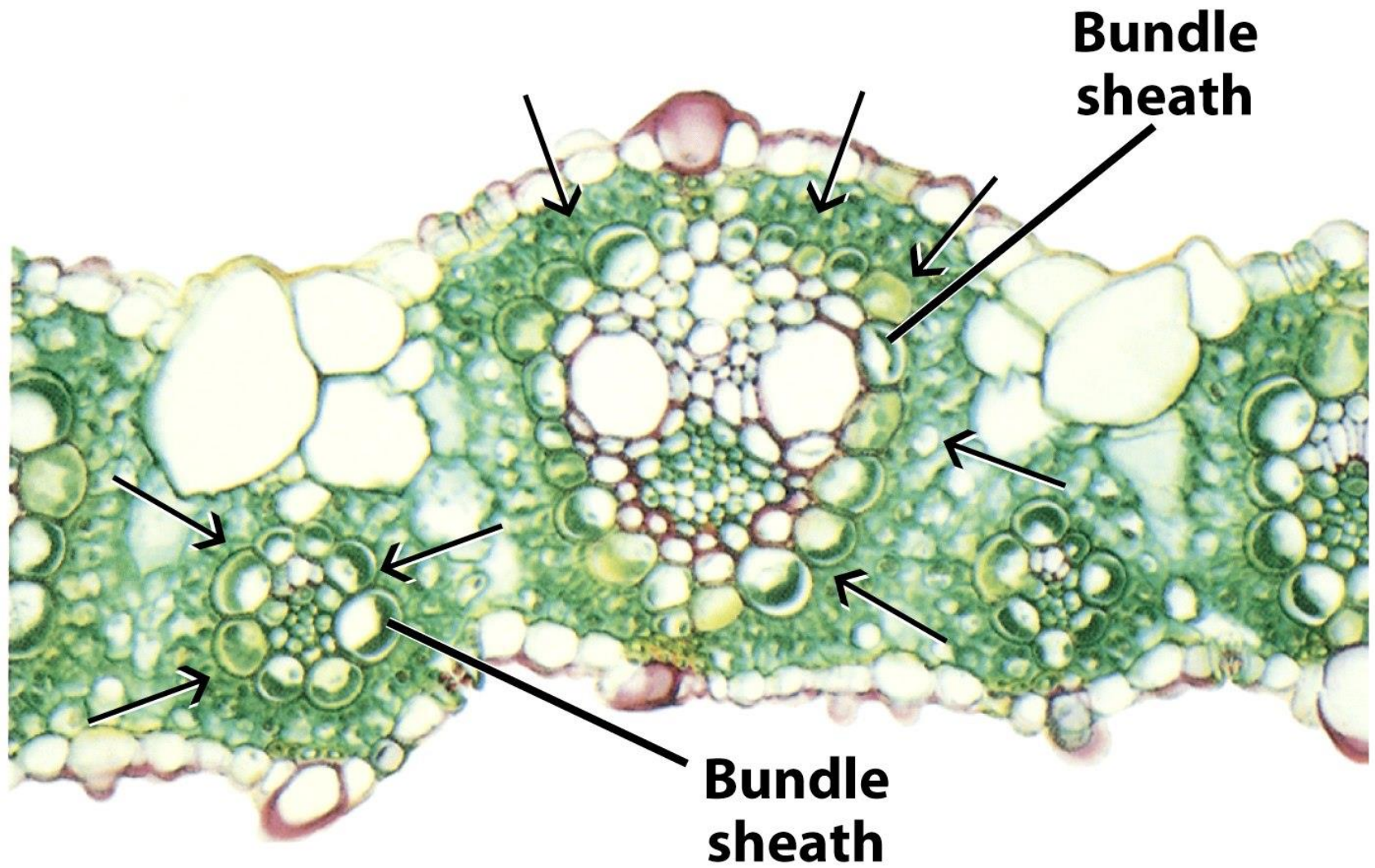


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