

BIO 103 Lab 22: Stem Lab

Materials

1. *Plectranthus scutellaroides* (coleus), fresh
2. *Plectranthus scutellaroides* (coleus) stem tip l.s. prepared slides
3. *Helianthus* (sunflower) stem c.s. prepared slides
4. *Zea mays* (corn) stem c.s. prepared slides
5. *Tilia* (basswood) 1, 2, & 3 yr old stem c.s. prepared slides
6. *Sambucus* (elderberry) lenticel prepared slide, demonstration
7. *Pinus* (pine) stem XRT prepared slide, demonstration
8. Examples of stem modifications including: rhizomes, tubers, bulbs, corms, tendrils, runners, thorns, and cladophylls
9. Twigs
10. Wood blocks
11. Pieces of branches showing wood and bark

Some Suggested Learning Goals

1. Know the externally visible parts of a woody twig in its winter condition and know their derivations or functions.
2. Know the locations and functions in a monocot stem of epidermis, cortex, primary phloem, primary xylem, and pith.
3. Know the locations and functions in young eudicot stems of epidermis, cortex, primary phloem, primary xylem, and pith, and what additional tissues are produced in older eudicot stems.
4. Understand the differences and similarities between monocot and eudicot stems.
5. Know the functions of plant stems.
6. Explain the difference between primary growth and secondary growth in eudicot stems.
7. Differentiate between springwood and summerwood and between heartwood and sapwood.
8. Explain the differences between radial, tangential, and transverse wood cuts and identify each from prepared slides.

Introduction

The above ground portion of the plant is called the **shoot** and includes both the stems and the leaves. Stems are modular. Each repeating module contains a **node** and **internode**. The node is the region of the stem where one or more leaves attach to the stem and a lateral bud is present, which can grow out to become a lateral branch. The internodes are simply the space between the nodes.

The stems provide support for the leaves, enabling them to intercept the light to optimize photosynthesis. In addition, the vascular tissue, in the stems, transports water from the roots to the leaves and carbohydrates from the mature leaves to the roots, flowers, fruits, and immature leaves.

Some eudicot plants live for several years, long enough to develop stems with **secondary growth**, forming **wood** and **bark**. This secondary growth increases the girth of

This lab is adapted from:

Evett RF, Eichhorn SE, Perry JB. 2013. Laboratory Topics in Botany. 8th ed. New York: WH Freeman; 23-1, 25-1, & 26-1 p.

Bio 103 Lab Manual Enzyme

Judd E. Hollander



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