



**MG17214 | DICOTILEDONENEAN
HERBACEOUS STEM (HELIAN ANNUS)**







Anatomical Model of a Dicotyledonous Herbaceous Stem Section (*Helianthus annuus*), magnified 300 times its natural size, sectioned longitudinally and transversely for detailed demonstration of the tegumentary, cortical, and central vascular cylinder zones, including phloem and xylem. Mounted on a base.

Applications:

Ideal for the study and training in plant anatomy, especially for understanding the structure of a dicotyledonous herbaceous stem. Suitable for teaching in schools, universities, and research institutions. Allows comparative analysis of anatomical structures.

Technical Features:

- * Detailed representation of the main structures of the stem.
- * All differentiated structures are displayed in different colors.
- * Numbered and hand-painted.
- * Produced with atoxic resin, approved in toxicological tests.
- * High-precision natural molding.
- * Manufactured from resistant synthetic material.
- * Includes an information card with the related structures.
- * Precise replicas.
- * High resistance.



* Model mounted on a polymer base with support.

3D Technology and Augmented Reality:

Our anatomical models offer a visual complement through information cards that activate 3D models viewable in augmented reality (AR). This interactive platform aids learning, allowing comparative analysis of anatomical structures and offering resources for education in anatomy, physiology, and pathophysiology.

Technical Specifications:

* Scale: 300x natural size.

* Material: Synthetic resin.

Main Structures:

Epidermis: Outermost cell layer that protects the stem against water loss, mechanical damage, and infections. It is composed of closely packed cells, usually coated with a cuticle.

Epidermal Residues: Remnants of epidermal cells that may remain after abscission of the epidermis, contributing to stem protection.

Angular Collenchyma of the Hypodermis: Supporting tissue located below the epidermis, with elongated cells and thickened cell walls at the angles, providing flexibility and support to the stem.

Chloroplasts within Collenchyma Cells: Organelles present in the collenchyma cells, responsible for photosynthesis, indicating that this tissue can contribute to energy production in the plant.

Cortical Parenchyma: Fundamental tissue that fills the cortex of the stem, with parenchyma cells that perform storage, photosynthesis, and substance transport functions.

Endodermis: Cell layer that delimits the cortex from the vascular cylinder, with cells that may have thickenings in their walls, regulating the transport of water and nutrients.

Bundle of Sclerenchyma Cells: Group of sclerenchyma cells, generally sclerenchyma, that provide additional mechanical support to the stem.

Sieve Plate Separation Tubes: Pores in the sieve plate of the sieve elements of the phloem, allowing communication and transport of substances between adjacent cells.

Wood Cambium Bundle: Layer of meristematic cells responsible for the secondary growth of the stem, producing xylem inwards and phloem outwards.



Xylem Parenchyma: Parenchyma tissue present in the xylem, with storage and substance transport functions.

Other structures can be verified directly on the physical piece or on the interactive 3D model.

About Anatomical Models:

They are developed with resin replication technology, offering an alternative for teaching and research. They present the main morphological characteristics with excellent cost-benefit, good resistance, hand painting, and numbering for precise identification of structures.

List of all visible structures:

- Epidermis
- Epidermal residues
- Angular collenchyma of hypodermis
- Chloroplasts within collenchyma cells
- Cortical parenchyma
- Endodermis
- Bundle of sclerenchyma cells
- Sieve plate separation tubes
- Wood cambium bundle
- Xylem parenchyma
- Tracheids
- Companion cells
- Glandular elements
- Exchange between wood bundles (meristematic tissue)
- Medullary ray parenchyma
- Pith parenchyma
- Tracheids