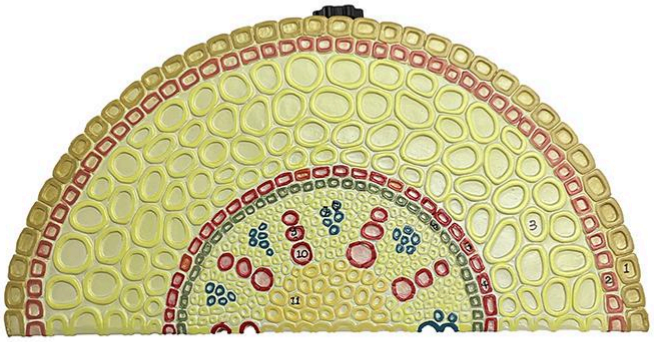
MG16862 | MONOCOTYLEDONA ROOT (ZEA MAYS)



Nasco
HEALTHCARE







Anatomical Model of a Monocot Root (Zea mays) - A detailed, enlarged (200x) representation of a monocot root, exhibiting in cross and longitudinal section the zones of primary structure, elongation cells and meristematic cells. The model is divided into three distinct segments and includes a polymer base with support and metal rod, as well as an information card with related structures.

Applications:

Ideal for the study of the structure and growth of monocot roots, aiding in the understanding of root regions (root cap, cell division region, elongation region and maturation region). Indicated for teaching and research in botany, biology and related fields. Allows comparative analysis of anatomical structures and offers resources for continuing education in plant anatomy and physiology.

Technical Advantages:

* High-precision natural molding;
* Manufactured from stable synthetic material and resin approved in toxicological tests;
* High-fidelity replicas;
* Numbered and hand-painted;

* Includes an information card with related structures;
* Interactive 3D model with augmented reality.

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 continuing education in anatomy, physiology and physiopathology.

Technical Specifications:

* Scale: 200x natural size;
* Main material: Resin;

Main Structures:

Rhizodermis: The outermost layer of the root, composed of epidermal cells, usually uniseriate, with the function of protection and absorption of water and nutrients from the soil. Presents root hairs, cellular projections that increase the absorption surface.

Exodermis: Layer of suberized cells that develops below the rhizodermis, providing additional protection to the root, especially after the loss of the rhizodermis. Acts as a barrier against water loss and pathogen entry.

Parenchyma Cells: Living cells, with the function of filling and storing substances. Found in various regions of the root, contributing to the support and metabolism of the tissue.

Endodermis: Cylindrical cell layer that delimits the root cortex. Its cells present the Caspary strip, a band of suberin that regulates the flow of water and ions to the vascular cylinder.

Water permeation points, unsuberized cells: Endodermis cells that maintain the ability to transport water, allowing the flow of water to the xylem.

Pericycle Cells: Meristematic cell layer located externally to the xylem and phloem, responsible for the formation of lateral roots and, in some plants, for the vascular cambium.

Companion Cells: Specialized cells that accompany the sieve elements of the phloem, assisting in the transport of sugars and other substances.

Protoxylem: The first xylem formed during root development, characterized by narrower vessels that generally collapse with root growth.

Protophloem: The first phloem formed, with smaller sieve elements that can also be affected by root growth.

Xylem: Vascular tissue responsible for transporting water and minerals from the roots to other parts of the plant. Presents vessels with variable diameter, depending on the stage of development.

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

About the Anatomical Models:

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

List of all visible structures:

- rhizodermis
- exodermis
- parenchyma cells
- Endodermis
- water permeation points
- cells without suberization
- pericycle cells
- companion cells
- Sieve tubes
- Sieve tubes
- tracheids with narrow lumen
- tracheas with wide lumen
- tracheids with narrow lumen
- tracheas with wide lumen
- xylem
- xylem parenchyma
- xylem parenchyma
- tracheas with wide lumen
- tracheids with narrow lumen
- endodermis
- rhizodermis



- exodermis
- parenchyma cells
- endodermis cells
- protoxylem
- protophloem
- epidermis cells
- periblem
- initial cells of the columella cap
- dermatogenic
- calyptrogen
- promeristem