

Plant Structure - A Colour Guide

2nd edition

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Description:

This fundamental guide to understanding plant structure offers plant scientists, plant biologists and horticulturalists in practice, academic life and in training a combination of concise scientific text and superb colour photographs and drawings.

The book deals with the development and mature form of plants, focusing throughout on structures at the anatomical, histological and sub-microscopic levels. Appropriate emphasis is given to plants of economic importance.

The new and totally revised edition has been expanded by 30% with 194 new photos and diagrams. The original author has been joined by Dr James Mauseth to create a formidable partnership of teaching and research experience from Europe and North America.

Key elements of the revised book include: recent findings (supplemented by DNA analysis) on the classification of flowering plants; current concepts of plant structure; detailed description of eg. leaves as insectivorous traps; spines in cacti, desert plants adapted for water storage, saltmarsh and aquatic plants; a new section on asexual plant multiplication; additional bibliography and website resources.

Plant Structure - A Colour Guide is designed as a tool for teaching and revision at undergraduate and graduate levels, as a complement to traditional textbooks for professionals and researchers, and as a general reference for non-specialists.

Some reviews of the 1st edition:

“The concept is remarkable....written to inform with maximum clarity and brevity.” **The Horticulturist**

“The author has succeeded in preparing material not only for students and professional biologists, but also for artists and interested lay people... Students will find the hundreds of full colour illustrations a welcome study resource.... visually delightful.” **Trends in Plant Science**

288 pp
578 colour illustrations
261 x 194 mm page size
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ISBN: 978-1-84076-092-7
Publication: 2008

Readership:

Professionals, scientists and students in: Plant Science, Plant Biology, Agriculture, Horticulture, Plant biochemistry, Plant physiology, Plant morphology, Plant pathology, Ecology, Amateur botanists, Secondary/high schools.

Key Features:

- A revised edition of a classic guide to understanding plant structure.
- New bestselling coauthor James Mauseth
- Integrates anatomy, histology and ultrastructure.
- Combines concise scientific text with colour photos and drawings of the highest quality.
- Emphasises plants of economic importance.
- Value at many levels for teaching, revision, research and reference.

Short Contents: Chapter 1 Introduction. Chapter 2 The plant cell. Chapter 3 Plant histology. Chapter 4 Apical meristems. Chapter 5 The green leaf. Chapter 6 The stem. Chapter 7 The root. Chapter 8 Plant reproduction.
(for full contents see over page)

Contents:

Chapter 1. Introduction. Assortment of land plants. Transpiration and translocation in vascular plants. General morphology of angiosperms. Vascular anatomy of angiosperms. Floral and reproductive features of angiosperms. Theme of the atlas.

Chapter 2. The plant cell. Introduction. Cell membranes. Nucleus. Plastids. Proplastids. Chloroplasts. Etioplasts. Amyloplasts. Chromoplasts. Leucoplasts. Mitochondria. Ergastic substances. Endoplasmic reticulum. Golgi apparatus. Vacuole. Microbodies. Ribosomes. Microtubules and microfilaments. Cell wall. Primary wall. Secondary wall. Cutin and suberin.

Chapter 3. Plant histology. Distribution of cells and tissues. Parenchyma. Collenchyma. Sclerenchyma. Secretory tissues. Phloem. Xylem. Structure of wood. Techniques of plant anatomy.

Chapter 4. Apical meristems. Introduction. Vegetative shoot apex. Early leaf and bud development. Reproductive shoot apex. Tissue differentiation in the young stem. Root apex. Tissue differentiation in the young root.

Chapter 5. The green leaf. Introduction. Morphology and venation. Anatomy of the lamina. Leaf epidermis. Mesophyll and sclerenchyma. Vascular tissue. Anatomy of the petiole. Modifications of the leaf. Leaves as insect traps. Chimera leaves. Succulent leaves. Alpine plants and leaves. Anatomy of cactus spines.

Chapter 6. The stem. Primary growth. Anatomy of the mature primary stem. Modifications of the primary stem. Aquatic (hydrophytes) and salt marsh/shoreline (hydrophytes) plants. Shoot dimorphism in cacti. Succulent desert plants. Secondary growth. Anatomy of the ordinary woody stem. Anomalous secondary growth. Raylessness. Unequal activity. Death of parts of the cambium. Unifacial vascular cambia. Multiple vascular cambia. Thickened monocot stem. Primary thickening meristems in monocots. Cambial zone in monocots. Periderm.

Chapter 7. The root. Introduction. Anatomy of the mature root. Lateral and adventitious roots. Secondary growth in roots. Succulent roots. Parasitic plants. Hemiparasites. Holoparasites. Ant-plants. Polymorphic root systems in mangroves. Mycorrhizae and root nodules.

Chapter 8. Plant reproduction. Asexual (vegetative) reproduction. Vegetative reproduction in nature. Artificial reproduction. Sexual reproduction in seedless vascular plants. Sexual reproduction in seed plants. Reproductive phases in seed plants. Reproductive tissues and organs in seed plants. General features of flowers. Perianth. Stamens (androecium). Carpels (gynoecium). Fertilization. Development of the seed. Embryo development. Endosperm. Seed coat. The fruit. Fruit wall. Seed release from dry seeds. Forage fruits and seed dispersal. Passive dispersal of fruits and seeds. Index.