1. Record Nr. UNINA9910143313803321

Titolo	Biology of the plant cuticle [[electronic resource] /] / edited by Markus Riederer and Caroline Muller
Pubbl/distr/stampa	Oxford ; ; Ames, Iowa, : Blackwell Pub., 2006
ISBN	1-280-74849-4 9786610748495 0-470-76296-9 0-470-98871-1 1-4051-7157-X
Descrizione fisica	1 online resource (464 p.)
Collana	Annual plant reviews ; ; v. 23
Altri autori (Persone)	RiedererMarkus MullerCaroline
Disciplina	575.451 580.5
Soggetti	Plant cuticle Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Biology of the Plant Cuticle; Contents; Contributors; Preface; 1 Introduction: biology of the plant cuticle; 1.1 The evolution of the plant cuticle; 1.2 Major functions of the plant cuticle; 1.2.1 Transpiration control; 1.2.2 Control of loss and uptake of polar solutes; 1.2.3 Controlling the exchange of gases and vapours; 1.2.4 Transport of lipophilic substances; 1.2.5 Water and particle repellence; 1.2.6 Attenuation of photosynthetically active and UV radiation; 1.2.7 Mechanical containment; 1.2.8 Separating agent in plant development; 1.2.9 Interface for biotic interactions 1.3 Convergence with other integuments1.4 Objectives of this book; References; 2 The fine structure of the plant cuticle; 2.1 Introduction; 2.1.1 The distribution of the plant cuticle; 2.1.2 Definition and nomenclature of the plant cuticle; 2.1.3 The pectin lamella; 2.2 The structure of the cuticle proper; 2.2.1 The procuticle; 2.2.2 The cuticle proper; 2.2.2.1 Lamellate substructure of the CP; 2.2.2.2 Lamella position and orientation; 2.2.2.3 What are the CP lamellae?; 2.3 Cuticle

polymers; 2.3.1 Chemical types in Angiosperm and Gymnosperm cuticles; 2.3.2 The algal cuticle
2.3.3 Chemical types in Bryophyte and Pteridophyte cutins2.3.4 Ontogeny, composition and structure of the CL; 2.3.5 Layering of the CL; 2.3.6 Cutin cystoliths; 2.4 Cuticle structural types; 2.4.1 Cuticle types 1 and 2; 2.4.2 Cuticle type 3; 2.4.3 Cuticle type 4; 2.4.4 Cuticle types 5 and 6; 2.4.5 A seventh cuticle type?; 2.5 Summary of the cuticle types; 2.5.1 Cuticle structure/ecology; 2.5.2 Cuticle thickness and environment; 2.5.3 Cuticle structure and phylogeny; 2.6 The epicuticular wax; 2.6.1 Epicuticular wax types; 2.6.2 Chemical and structural classification of EW; 2.6.2.1 Granules
2.6.2.2 Filaments2.6.2.3 Plates; 2.6.2.4 Tube-type waxes; 2.6.2.5 Rodlet-type waxes; 2.6.3 The background EW film; 2.7 Cuticular pores and permeability of the CM; 2.7.1 Permeability of water and solutes; 2.7.2 Wax secretion, cuticular pores and microchannels; 2.7.3 Relative sizes of wax crystals and cuticle; 2.8 Crystallisation studies on EW; 2.8.1 The tube wax crystal; 2.8.2 The single-compound hypothesis; 2.8.3 How do wax crystals grow?; 2.9 Crystal orientation and spatial patterning; 2.10 Degradation of EW; 2.11 Summary of cuticle ontogeny; Acknowledgements; References
3 The cutin biopolymer matrix3.1 Introduction: protective plant polymers; 3.2 Biosynthesis; 3.3 Monomer composition; 3.4 Polymeric structure of intact cutin; 3.5 Molecular structure of cutin fragments; 3.5.1 Oligomeric degradation products; 3.5.2 Polymeric residues from chemical degradation procedures; 3.6 Mechanical properties; 3.6.1 Methodology; 3.6.2 Measurements of surface elastic modulus; 3.6.3 Measurements of bulk molecular dynamics; 3.7 Thermodynamic properties; 3.8 Summary and prospectus; Acknowledgements; References; 4 Composition of plant cuticular waxes
4.1 Methods used for the chemical analysis of plant cuticular waxes

Sommario/riassunto

Annual Plant Reviews, Volume 23A much clearer picture is now emerging of the fine structure of the plant cuticle and its surface, the composition of cuticular waxes and the biosynthetic pathways leading to them. Studies assessing the impact of UV radiation on plant life have emphasized the role of the cuticle and underlying epidermis as optical filters for solar radiation. The field concerned with the diffusive transport of lipophilic organic non-electrolytes across the plant cuticle has reached a state of maturity. A new paradigm has recently been proposed for the diffusion of polar c