

1. Record Nr.	UNINA9910253863303321
Autore	Sen Mandi Swati
Titolo	Natural UV Radiation in Enhancing Survival Value and Quality of Plants [[electronic resource] /] / by Swati Sen Mandi
Pubbl/distr/stampa	New Delhi : , : Springer India : , : Imprint : Springer, , 2016
ISBN	81-322-2767-0
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (204 pages) : illustrations (some color), tables
Disciplina	571.456
Soggetti	Oxidative stress Radiation - Safety measures Radiation—Safety measures Plant physiology Agriculture Plant anatomy Plants - Development Oxidative Stress Effects of Radiation/Radiation Protection Plant Physiology Plant Anatomy/Development
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	1. Natural Ultraviolet Radiation -- 2. Effect Of UV Radiation On Life Forms -- 3. UV Radiation Induced Damage at Molecular Level -- 4. Signal Transduction Transmitting UV Effect In Plant Cells -- 5. UV Induced Acclimation Strategies In Plants -- 6. Genotype X (UV) Environment Interaction-based Trait Expression -- 7. Breeding/Transgenic Approach for Enhancing UV Adaptive Traits in Plants.
Sommario/riassunto	This book is the first of its kind to highlight the positive impact of natural UV radiation on plants through unique adaptations in various metabolic pathways, and provides an evolutionary sketch of the development of molecular mechanisms for protecting plants from solar UV ever since their migration to terrestrial habitats. Experimental

evidence is provided for establishing how plants, through their stationary habit in the open field, survive and flourish by developing suitable UV acclimation strategies through the repair of damaged macromolecules and/or upregulation of screening compounds viz. flavonoids. Presenting an analysis of related literature, it also highlights the importance of outdoor experiments over those in closed chamber under artificial UV light for obtaining realistic data. The book presents a comprehensive account of the stratospheric ozone layer, its formation and seasonal thinning, with particular reference to alarming anthropogenic destruction of the ozone layer since the last quarter of the twentieth century, which has resulted in increased UV fluence on Earth. It discusses variations in the hazardous impact of UV on life at different latitudes through the ages, and examines altitudinal variations in UV effects in case studies demonstrating high antioxidant content and aroma status in Darjeeling tea leaves (at high altitudes) compared with those of the same tea clones in Assam leaves (at low altitudes), with both sites being at the same latitude. It provides evidence which suggests that the UV effects relating to the expression of seed vigour-viability could be epigenetic. Further, it presents recently developed microscopic technologies for demonstrating the penetration of UV into plant cells, and discusses how cellular metabolism can be affected either directly or via signal transduction. Effect of damage in DNA (the key target of UV radiation) has been demonstrated and estimated using precise techniques. The latest “FOX Hunting” technique as a useful means of transcriptome analysis that may be used for developing UV tolerant plants through Marker Assisted Breeding has also been discussed. Using biochemical and biotechnological methods, the experiments presented highlight the gene X environment based upregulation of specific metabolic pathways, allowing i) value addition in plant-derived food, and ii) paving the way for the industrial manufacture of Alternative Medicine products. The book is enriched by a critical review of the available literature and appropriate case studies selected from the author’s own findings, which span nearly four decades of active research.
