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1	Ekush sotoker chokhe Rammohan	978-81-966244-1-5	Book	Bangali	Publisher	Pustak Bipani	Editor :Abhijit Kumar ghosh , Co-Editor :Prakash Chandra Sarkar	14/01/2024

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1	Janmodwishatobarshe Vidyasagar (Bibidha Prasanga)	978-93-92500-37-4	Book	Bengali	Publisher	Sristisukh Prokashan LLP	Editor : Manimekhala Maiti	15/10/2022

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1	The Fading Ethnicity: Linguistic Shift of Tribal Groups in West Bengal (1991-2011)	978-81-971146-5-6	Book	English	Publisher	INSTITUTE OF LANGUAGE STUDIES AND RESEARCH (ILSR) PRESS	Author : Amitava Das	15/03/2024

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1	SUMITAKHHAR (Edition 1ST)	978-93-88868-29-7		Bangali	Publisher		Author : Edited by Dr.ALOK CHAKRABORTY	

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1	Sankha Ghosh, Sreecharaneshu	978-81-949759-0-8	Book	Bengali	Publisher	ABHISHEK CHATTERJEE	Author : Sibabrata Chattopadhyay	10/02/2022

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1	Rabindranather Nataker Sanlap (Edition No)	978-81-934966-9-5	Book	Bengali	Publisher	Diya Publication	Author : Sibabrata Chatterjee	28/07/2023

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1	Rabindranather Nataker Sanlap (Edition 1st)	978-93-87003-89-7	Book	Bengali	Publisher	Diya Publication	Author : Sibabrata Chattopadhyay	01/11/2023

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1	Gyantapasi Sunitikumar Sathik Abalokon (Edition 1)	978-93-89289-89-3		Bengali	Publisher		Author : Edited by Baniranjan Dey	

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1	Rabindra Upanyaser Anginai (Edition 1ST)	978-93-88868-21-1		Bengali	Publisher		Author : Srabani Basu	

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Serial No. 51

Microbial Metabolism of Organophosphates: Key for Developing Smart Bioremediation Process of Next Generation

| Chapter | First Online: 22 March 2020

| pp 361–410 | Cite this chapter

Microbial Technology for Health and Environment

Santanu Pailan, Kriti Sengupta & Pradipta Saha

Part of the book series: Microorganisms for Sustainability ((MICRO,volume 22))

Abstract

Currently organophosphate compounds constitute one of the largest families of chemical compounds that are used for pest control, mainly for better crop yield worldwide. Due to their toxicity, persistence, and adverse effects, some organophosphates (like parathion and methyl parathion) were classified and registered as extremely hazardous by the World Health Organization (WHO) and US EPA (US Environmental Protection agency) and have been banned in many countries. Some of the hydrolysis intermediates (such as 4-

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Serial No. 52

Exopolysaccharides and Biofilms in Mitigating Salinity Stress: The Biotechnological Potential of Halophilic and Soil-Inhabiting PGPR Microorganisms

| Chapter | First Online: 26 July 2019

| pp 133–153 | Cite this chapter

Microorganisms in Saline Environments: Strategies and Functions

Aparna Banerjee ✉, Shrabana Sarkar, Sara Cuadros-Orellana & Rajib Bandopadhyay

Part of the book series: Soil Biology ((SOILBIOL,volume 56))

Abstract

Soil salinity is a key environmental factor restraining the productivity of soil and crop plants. In different parts of the world, agricultural productivity is decreasing mostly because of drought and salinity increase. The situation may become worse for global warming in the future. A wide range of adaptation and mitigation strategies have been

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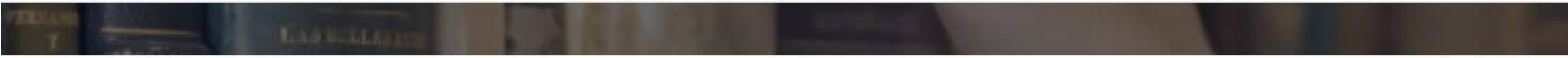

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Cadmium Tolerance in Plants

Agronomic, Molecular, Signaling, and Omic Approaches

2019, Pages 247-254

Chapter 9 - Cadmium Accumulation in Crops and the Increasing Risk of Dietary Cadmium Exposure: An Overview

Sujit Roy

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Abstract

Soil contamination with toxic heavy metals, such as cadmium (Cd), lead (Pb), and mercury (Hg), has become one of the major global environmental problems since the year 2000. During these years, increased industrialization, along with anthropogenic activities and rapid change in agricultural practices, has significantly contributed to the enhanced accumulation of heavy-metal elements in the environment. Plants, being sessile in nature and with their obligatory dependence on sunlight for energy, are widely exposed to various environmental stress factors, including the heavy metals, and therefore, are constantly facing the tremendous task of maintaining the genome integrity for survival and adaptation under such stress conditions. Excess level of accumulation of heavy metals in soil frequently induces both cytotoxic and genotoxic effects and thus adversely affects plant growth and reproductive potential by imposing genome instability. Soil contaminated with heavy metals like Cd and Pb represent one of the important stress conditions for the plants. Cd is released into the environment mainly through some anthropogenic activities, such as use of phosphate fertilizers and regular disposal of industrial, municipal, and household wastes. These sources may cause enhanced accumulation of Cd in the soil and hence in crop plants. Eventually, this may increase the dietary Cd exposure. This situation has created a problem of major concern worldwide, as Cd is particularly a potentially harmful pollutant because of its ability to induce high cellular toxicity. This review mainly provides insights into the cytotoxic effects of Cd in plants and the increasing human risk for developing various diseases due to the problem of enhanced accumulation of this harmful heavy metal in the food chain and dietary sources.

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Cadmium Tolerance in Plants
Agronomic, Molecular, Signaling, and Omic Approaches
2019, Pages 223-246

Chapter 8 - Cadmium Toxicity in Plants: Unveiling the Physicochemical and Molecular Aspects

Rajarshi Ghosh [1], Sujit Roy [2]

https://doi.org/10.1016/B978-0-12-815794-7.00008-4

Abstract

With growing industrialization and nonjudicious use of chemical fertilizers, heavy metal–mediated chemical toxicity has become a major environmental threat for plants around the globe. Heavy metal ions cause damage to the structural, enzymatic, and nonenzymatic components of plant cells, often resulting in loss of cell viability and thus negatively affecting plant growth, development, and finally crop productivity. Like the majority of heavy metals, cadmium (Cd) enters the environment and ecosystem mainly from industrial processes and fertilizer applications and is eventually transferred to the food chain through plants. Thus, Cd toxicity is considered a major threat for humans, animals, and plants. Cd accounts for about 0.1 ppm of the earth's crust. In nature, Cd contamination in soil and water generally comes from natural, agricultural, industrial, and domestic wastes. Often Cd contamination in soil may occur naturally during weathering processes. In biological systems including plants, Cd uptake mainly takes place in the form of Cd(II). After entering into plant cells, Cd generally binds to the –SH (thiol) groups of proteins and thus disrupts protein structure and function. Furthermore, Cd toxicity induces oxidative and genotoxic stress via reactive oxygen species production, which then causes oxidative damage to cellular macromolecules and the photosynthetic apparatus. The overall effects are reflected at physiological and biochemical levels with decreased membrane stability and pigment production leading to compromised photosynthetic yield, hormonal and nutrient imbalance, and the inhibition of DNA replication, gene expression, and cell division. This chapter mainly illustrates our present understanding of the physicochemical properties and molecular mechanism of Cd-mediated toxicity and stress response in plants and also highlights the importance of identifying potential targets in the associated pathways for improved tolerance to Cd stress in crops.

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2022, Chemosphere

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>
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> …In this plant, root cells may actively avoid Cd cations due to an advanced uptake system of the roots (Cobbett and Goldsbrough, 2002; Marschner, 2011). In addition, roots of many plants can retain heavy metals and significantly reduce their translocation into the shoots (Bose and Bhattacharyya, 2008; Lux et al., 2011; Ghosh and Roy, 2019). The restriction in root to shoot transfer may be stronger for some specific heavy metals such as Pb and in particular Cd (Lux et al., 2011; Marschner, 2011) that offer a good opportunity regarding edible crops.…

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Modulation of growth and key physiobiochemical attributes after foliar application of zinc sulphate (ZnSO<inf>4</inf>) on wheat (Triticum aestivum L.) under cadmium (Cd) stress ↗

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Serial No. 56

ROS and Oxidative Stress: Origin and Implication

| Chapter | First Online: 11 May 2019

| pp 1–31 | Cite this chapter

Reactive Oxygen Species in Plant Biology

Soumen Bhattacharjee

Abstract

Molecular oxygen (O_2) is the primary cellular electron acceptor in aerobic respiration that serves fundamental roles in membrane-linked ATP formation and other fundamental cellular and metabolic functions. But, as an untoward but inescapable consequence of different metabolic events in oxygen-saturated cellular environment, reactive oxygen species (ROS) are incessantly generated by partial or incomplete reduction of molecular oxygen. In plants, ROS are continuously generated as oxidation – reduction cascades of different metabolism located in different cellular compartments and as by-product of various metabolic events. The most important ROS include superoxide ($O_2^{\cdot -}$), perhydroxy radical ($HO_2^{\cdot}$), hydrogen peroxide (H_2O_2), hydroxy radical ($OH^{\cdot}$), and singlet oxygen ($^1O_2$). The other secondary oxidative products like alkoxy radical ($RO^{\cdot}$), peroxy radical ($ROO^{\cdot}$),

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Serial No. 57

ROS and Antioxidants: Relationship in Green Cells

| Chapter | First Online: 11 May 2019

| pp 33–63 | Cite this chapter

Reactive Oxygen Species in Plant Biology

Soumen Bhattacharjee

Abstract

The redox homeostasis of plant cell, which largely depends on prooxidant and antioxidant status, is perturbed under environmental assault. In fact, the imposition of abiotic and biotic stresses changes redox status or homeostasis of the plant cell toward prooxidants and leads to a condition called oxidative stress. Orchestrated antioxidative defense that largely comprises of information-rich redox buffers and enzymes ensues to combat the situation, specifically at the site of action of the stress. Thus, the functional roles of these antioxidative defense responses include the restoration of metabolic redox homeostasis, the protection of the photosynthetic machinery, the preservation of membrane integrity, the protection of nucleic acids and proteins, etc. Current progress of work suggests that

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ROS in Aging and Senescence

| Chapter | First Online: 11 May 2019

| pp 65–79 | Cite this chapter

Reactive Oxygen Species in Plant Biology

Soumen Bhattacharjee

Abstract

As an unavoidable consequence of aging and natural course of senescence, disruption of redox homeostasis due to over-accumulation of ROS (reactive oxygen species) in plant cell is observed. Plants have evolved an array of self-protective defensive tools to oppose loss of redox homeostasis due to stress-induced aging and also natural course of senescence. However, it is becoming evident that ROS, which are generated during aging and natural course of senescence, are recognized by plant as a signaling agent for triggering responses. In fact, one of the earliest events upon recognition of an unfavorable environmental cue and infection is the accumulation of reactive oxygen species (ROS). The tissue necrosis triggered by reactive oxygen species (ROS) during biotic stress increases host susceptibility to necrotrophic but resistance to biotrophic pathogen. Strong evidences corroborate the view that ROS serve as a signaling agent in a systemic signaling

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ROS and Oxidative Modification of Cellular Components

| Chapter | First Online: 11 May 2019

| pp 81–105 | Cite this chapter

Reactive Oxygen Species in Plant Biology

Soumen Bhattacharjee

Abstract

ROS, the inevitable by-products of aerobic metabolism, when got escaped from antioxidant-mediated detoxification and accumulated in high concentration, may react nonspecifically with almost all important biomolecules and cause irreversible damage to those biomolecules which may cause metabolic dysfunction and inactivation of key cellular functions. In fact, there exist several evidences on environmental stress (both abiotic and biotic)-mediated changes in redox status and corresponding modulation of lipid and protein oxidation. ROS-mediated peroxidation of lipid, particularly the membrane lipid peroxidation (MLPO), which is normally linked with aging, senescence, and stress-induced oxidative damages, is extremely important from its mechanistic point

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ROS and Regulation of Photosynthesis

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Reactive Oxygen Species in Plant Biology

Soumen Bhattacharjee

Abstract

In plant, cell chloroplast is one of the prime locales for the formation of ROS and the origin of redox signal. Any redox imbalance in photosynthetic electron transport and photosynthetic carbon reduction cycle eventually causes generation of ROS in plants. An efficient antioxidative defense operates both at metabolic interface and at genetic level for processing ROS efficiently for the maintenance of redox homeostasis and ROS pool. The significance of antioxidative defense network in the maintenance of optimum photosynthetic rate has been revealed in many studies involving molecular genetics and proteomic approaches. Recent studies have confirmed that the internal redox state of some important components of Z-scheme electron carriers (plastoquinone, cytochrome b_6f complex, etc.) affects chloroplast gene expression, hinting the significance of chloroplast redox signal in controlling photosynthesis. Additionally, through redox

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ROS: Central Component of Signaling Network in Plant Cell

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Reactive Oxygen Species in Plant Biology

Soumen Bhattacharjee

Abstract

Plants often deliberately generate and exploit reactive oxygen species (ROS) or its secondary breakdown products for a number of processes ranging from cell signaling to gene expression. The cellular language associated with ROS signaling network involves a close coordination of four interacting phenomenons, ranging from ROS sensing, signaling, differential expression of redox-sensitive genes, and influencing stress and developmental responses of the plant. The role of ROS as "second messenger" modulating the activities of specific transcription factors or functional proteins is well elucidated. Apart from its bona fide role in the signaling cascades, ROS often complements, synergizes, and antagonizes several growth regulatory circuits through cross talking

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Exploring Oxidative Stress in Plants: Proteomic and Genomic Approaches

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Reactive Oxygen Species in Plant Biology

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Choice of Explant for Plant Genetic Transformation

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Biolistic DNA Delivery in Plants

Nibedita Chakraborty, Priyanka Chakraborty, Moutushi Sen & Rajib Bandopadhyay

Part of the book series: Methods in Molecular Biology ((MIMB,volume 2124))

Abstract

Particle bombardment or biolistic transformation is an efficient, versatile method. This method does not need any vector for the gene transfer and is not dependent on the cell type, species, and genotype. The success of any transformation technique depends on the starting experimental materials or the explants. Here, we describe the factors that have influenced the choice of explants in biolistic transformation. Many general factors in the selection of explants in the development of transgenic plants are presented here.

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Role of Plant Growth-Promoting Rhizobacteria (PGPR) for Crop Stress Management

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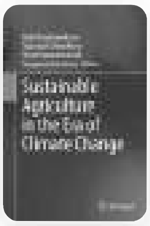

Sustainable Agriculture in the Era of Climate Change

Ashutosh Kabiraj, Krishnendu Majhi, Urmi Halder, Moitri Let & Rajib Bandopadhyay

Abstract

Crops under both abiotic and biotic stress are the major constraints on productivity. A number of factors like physical disorders, disease susceptibility, toxicity, hormonal imbalance, and nutritional deficiency interfere with the growth and development of plant under stress condition. Under these circumstances, rhizoremediation with the help of the plant growth-promoting rhizobacteria can mitigate stress-induced adverse effects on crop productivity. Plant growth-promoting rhizobacteria and their associated molecules play dual role by affecting both nutrition and resistance concomitantly through overlapping mechanisms. These free-living plant growth-promoting rhizobacteria actively colonize plant roots, exerting beneficial effects using their own metabolism or by

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Application of Bioinformatics for Crop Stress Response and Mitigation

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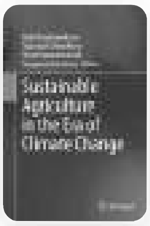

Sustainable Agriculture in the Era of Climate Change

Anubhab Laha, Priyanka Chakraborty, Chiranjib Banerjee, Anindya Sundar Panja & Rajib Bandopadhyay

Abstract

Due to the present changes in the global environmental scenario, every day several crop plants face different types of stress from abiotic and biotic factors. The cost of overcoming the obstacle of stress has a direct impact on the yield of the plants. The abiotic stresses can range between drought, cold, high temperature, high relative humidity, salinity and heavy metals. The plant pathogens can be a reason of biotic stress. Just like in the field of any applicative studies, the role of bioinformatics is undeniable too in the field of study of stress responses. Stress has a direct effect on the growth and development of the plants, which consequently has an adverse effect on the productivity of the crop plants. This has

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Microbial Production of Polysaccharides

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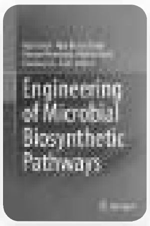

Engineering of Microbial Biosynthetic Pathways

Urmi Halder, Raju Biswas & Rajib Bandopadhyay

Abstract

A wide variety of bacterial species, and few algae, fungi, and yeasts have shown to produce a number of polymeric substances. The molecular weights of polysaccharides of different origins may differ widely. Different types of bacterial polysaccharides have been reported, and a few numbers was approved as commercial products. Polysaccharide production from pathogenic bacteria are appeared to be cost-effective, and maintenance of product quality is found quite difficult. Still several products, including xanthan and gellan from a small number of Gram-negative bacteria are acknowledged in chemical industry. Potent microbial polysaccharide has been commercialized due to versatile physical properties, which is appropriate for industrial usages. Since twentieth century, potential bioactivities of polysaccharides have been focused and finally it gets medical applicability by

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Microbial Treatment for Removing Synthetic Dyes from Industrial Effluents

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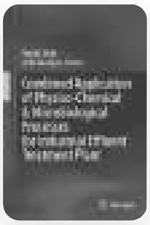

Combined Application of Physico-Chemical & Microbiological Processes for Industrial Effluent...

Shrabana Sarkar, Priyanka Chakraborty & Rajib Bandopadhyay

Abstract

Industrial effluent is one of the main causes of environmental pollution. Synthetic azo dyes are widely used in different industries like food, paper, or textile industry. In textile industry, unbound synthetic dyes are released through effluent, which shows awfully sharp effect on the health of different organisms including humans and the entire ecosystem. Though coloured textile industrial effluent has adverse effect on all types of biological network, it has direct effect on water ecosystem because of the general industrial sewage released in nearby water bodies. However, there are different types of physical and chemical waste treatment methods, but those consume huge amount of

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