

3.4.5 Number of books and chapters in edited volumes published per teacher during the last five years (2019-2023)

| Sl. No. | Name of the teacher | Title of the book published | Title of the chapters published | Year of publication | ISBN number | Whether at the time of publication Affiliating Institution was same Yes/No | Name of the publisher |
|---------|------------------------|---|--|---------------------|-------------------------|--|-----------------------|
| | Dr. Ruqeya Nazir | <i>Bioactive Compounds and Nutraceuticals from Dairy, Marine, and Nonconventional Sources: Extraction Technology, Analytical Techniques, and Potential Health Prospects</i> | Technological Aspects of Bioactive Compounds and Nutraceuticals from Microbial Sources. In <i>Bioactive Compounds and Nutraceuticals from Dairy, Marine, and Nonconventional Sources</i> | 2024 | 13:978-1774914984 | | Apple Academic Press |
| | Dr. Buhan Hamid | <i>In Nano-Bioremediation for Water and Soil Treatment</i> | Nanoremediation: A Sustainable Reclamation Method for Future Deployment | 2024 | 13:978-1774914861 | | Apple Academic Press. |
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| | Prof. Bashir Ah. Ganai | <i>In Biotechnologies and Genetics in Plant Mutation Breeding</i> | In Vitro Mutagenesis via EMS and Gamma Irradiations | 2023 | 13:9789380386324 | | Apple Academic Press. |
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| | Prof. Bashir Ah. Ganai | <i>In A Molecular Approach to Immunogenetics</i> | Immunopharmacology of Alzheimer's disease | 2022 | 13-978-0748743704 | | Academic Press. |
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Phytomedicine

A Treasure of Pharmacologically Active Products from Plants

2021, Pages 427-460

Chapter 16 - Bioprospecting of endophytic fungi for antibacterial and antifungal activities

Bhat Mohd Skinder ^a, Bashir Ahmad Ganai ^a, Abdul Hamid Wani ^b

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<https://doi.org/10.1016/B978-0-12-824109-7.00025-X>

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Abstract

Bioprospecting is a tool to find diversity of various endophytes and ways to commercialize them. Endophytic fungi reside in plant tissues being a vascular plant or grasses) having asymptomatic symbiotic association for part of or the entire life cycle. There are at least more than one endophyte inhabiting 300,000 plant species worldwide. These are considered a paragon of secondary metabolites, which have revolutionized the pharmaceutical industry by producing pharmacologically active substances such as alkaloids, flavonoids, steroids, terpenoids, phenolic acids, benzopyranones, chinones, quinone, tetralones, xanthenes, etc., depicting various activities such as antibacterial, antimycotic, antimalarial, antioxidant, anticarcinogenics, antihelminthic, etc., for example, the β -lactam antibiotic "penicillin" from *Penicillium* sp. and the antifungal agent "griseofulvin (C₁₇H₁₇ClO₆)" extracted from *Pencillium griseofulvum*. More than 35% of endophytes are isolated from medicinal plants, and more than 80% of endophytic fungi produce biologically active compounds. The secondary metabolites and medicinal plants contribute more than 80% of natural drugs to the pharmaceutical industry or markets.

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Microbes and Microbial Biotechnology for Green Remediation

2022, Pages 169-183

Chapter 9 - Biochar and its potential use for bioremediation of contaminated soils

Shahnawaz Hassan¹, Sabreena¹, Muzaffar Zaman¹, Aarif Yaseen¹, Bashir Ah Ganai²

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Abstract

In contemporary times, owing to anthropogenic activities, soil contaminated with HMs has progressively become a grave global environmental issue affecting not merely ecosystem health and agricultural production but also posing a grave hazard to human well-being. Substantial efforts have been made to remediate contaminated soils either by immobilization or elimination by bioremediation and phytoremediation. Biochar is documented as an encouraging contrivance because of its large surface area and greater dimensions to engross HMs and organic pollutants. Biochar can possibly be exploited to diminish the HM bioavailability and leachability in soils utilizing diverse mechanisms like adsorption and other physicochemical reactions. Being alkaline in nature, it enhances soil pH and bestows heavy metal stabilization. Understanding the characteristics and interactions of biochar with soil and biota is indispensable to consider its impressions on bioremediation of tainted soils. This may offer a new elucidation to the soil contamination problem for cost-effective remediation strategies.

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Freshwater Microbiology

Perspectives of Bacterial Dynamics in Lake Ecosystems

2019, Pages 137-174

Chapter 4 - Spatio-temporal patterns of bacterial diversity along environmental gradients and bacterial attachment to organic aggregates

Suhaib A. Bandh¹, Sana Shafi¹, Nowsheen Shameem¹, Rubiya Dar², Azra N. Kamili², Bashir A. Ganai²

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Abstract

Variation of microbial diversity along different gradients is now a fact beyond any doubt. Different types of microbes get attached to different types of substrates in water bodies depending on the physical, chemical, and biological features of the attaching surfaces and the adjoining environments. In this chapter, a detailed discussion has been done on the spatial-temporal distribution of microbes along with the drivers of microbial diversity in freshwater ecosystems, explaining the patterns and influence of different drivers on their distribution. It explains the distribution pattern along the lines of gradient like the altitudinal gradient, the latitudinal gradient, the urban water quality gradient along with the effect of grazers and the influence of microcystis decomposition on microbial assemblages in lakes. Role of bottom-up (such as temperature, pH, nitrogen, and phosphorus) and top-down factors (such as predation) regulating the density, diversity, and distribution of bacterial community composition in freshwater lake ecosystems has also been detailed out. The diversity-functioning relationship of bacterial communities in lake ecosystems has also been explained in the chapter. It further goes on explaining the organic aggregates vis-à-vis the diversity and abundance of bacteria, turnover rates, and growth efficiencies. The chapter concludes with a deliberation on the ecological significance of the organic aggregates, showing how well the organic aggregates work as the hotspots of bacterial diversity and their functioning in lake ecosystems.

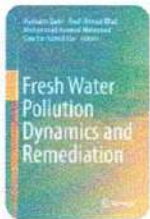
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[Fresh Water Pollution Dynamics and Remediation](#)

[Bhat Mohd Skinder](#), [Baba Uqab](#) & [Bashir Ahmad Ganai](#)

 1347 Accesses  8 [Citations](#)

Abstract

The most important and visible factors like the population explosion, urbanization and economic growth are accountable for ecological degradation and contamination. Ecological detoxification is a riddle that needs to be solved through ecological concepts and techniques. Thus, the application of advanced science and technology helps us to apply diverse biota for pollution abatement. Diverse and potential biota has efficiency to reinstate the polluted environment effectively, but dearth of knowledge about the factors viz., pH, moisture content, temperature, redox potential, soil type and oxygen controlling the growth and metabolism of microorganism in polluted environments often limits its



Protein Modificomics

From Modifications to Clinical Perspectives

2019, Pages 1-35

Chapter 1 - Posttranslational Modifications of Proteins and Their Role in Biological Processes and Associated Diseases

Irfan-ur-Rauf Tak *, Fasil Ali †, Jehangir Shafi Dar *, Aqib Rehman Magray *, Bashir A. Ganai *, M.Z. Chishti *

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Abstract

A posttranslational modification (PTM) depicts an imperative means for diversification and regulation of the cellular proteome due to its tremendous scope in various biological processes such as replication, histone modifications, transcription, translation, cell signaling, apoptosis, and cancer, etc. Most PTMs occur in a time- and signal-dependent manner, and determine the overall structure of proteins and also their function in regulating various biological processes. Most PTMs are brought about by small molecular weight functional groups such as phosphate, acyl, acetyl, amide, alkyl, myristoyl, palmitoyl, prenyl, hydroxyl, ubiquitin, and sugars to the amino acid side chains of the protein. Advanced molecular techniques have enumerated more than 200 posttranslational modifications and, in fact, many of them have been discovered recently. Posttranslational modifications can take place at any stage during the maturation of the protein, whereas other modifications usually take place after the process of folding and sorting of proteins and are responsible for their catalytic activity. Study of posttranslational modifications and their mechanism of regulation of various cellular signaling pathways have significant medical implications. Identification, description, and mapping of the posttranslational modifications are very important for discerning their functional implications in a biological context. Therefore, an accurate understanding of protein posttranslational modifications is very important, not only for gaining insight about a multitude of cellular functions and associated diseases, but also regarding drug development for many life-threatening diseases such as neurodegenerative disorders and



Protein Modificomics

From Modifications to Clinical Perspectives

2019, Pages 339-359

Chapter 13 - Protein Glycosylation: An Important Tool for Diagnosis or Early Detection of Diseases

Humayra Bashir *, Barqul Afaq Wani †, Bashir A. Ganai *, Shabir Ahmad Mir ‡

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Abstract

Proteins are highly dynamic diverse cellular entities regulating all cellular functions. Translated from transcripts, nascent peptides undergo posttranslational modifications (PTMs). Although these modifications impart important characteristic features to the proteins, the unusual modification pattern of some proteins also lead to their loss/gain in functions leading to disorders. Studies on protein modifications are expected to establish potential suitable biomarkers useful for diagnosis and early detection of diseases. Glycosylation is one of the most important PTMs of proteins, which plays an essential role in various biological processes. In fact, alterations in glycosylation are associated with many diseases and, thus, act as promising targets and biomarkers for monitoring health conditions. Understanding the exact mechanism contributing to altered glycoproteomes in specific diseases is very important to advance our molecular knowledge of the underlying pathogenesis. Over the last few years, revolutionary advances in “omics” technologies have highlighted the progressive need to restructure traditional approaches to basic and clinical research in order to facilitate the rapid, efficient integration and translation of these new technologies into novel effective therapeutics. The recent advances in mass spectrometry (MS) instrumentation, combined with innovative peptide fractionation and protein/peptide tagging have advanced our understanding of the complex and dynamic nature of proteomes and opened the way for reliable and high-throughput characterization of protein PTMs. Due to their heterogeneous nature, development of rapid and sensitive methods for analysis of aberrant glycoproteins associated with diseases has become critical. MS has become a powerful tool for the determination of chain length and composition of monosaccharide classes, whereas linkage information and monosaccharide identification are usually deduced using gas chromatography (GC) (after chemical



Phytomedicine

A Treasure of Pharmacologically Active Products from Plants

2021, Pages 1-33

Chapter 1 - Phytomedicines: Diversity, extraction, and conservation strategies

Sumaira Rashid^a, Lone Rafiya Majeed^b, Bisma Nisar^a, Hina Nisar^a, Aftab Ahmad Bhat^c,
Bashir Ahmad Ganai^d

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Abstract

Herbal medicines also called as phytomedicines are mixtures of plant metabolites that contain pharmacologically active compounds that exhibit some therapeutic properties. Phytomedicines have a massive array of biological activities, and therefore these are practiced worldwide since ancient times. The parts of plant utilized for phytomedicines are leaves, barks, tubers, roots, herbs, and the plant extracts. These plant parts secrete substance like alkaloids, terpenes, phenolic compounds, basic metabolites, glycosides, and secondary metabolites, and preparations formed with medicinal plants include decoction, emulsion, apozems, liniments, electroactives, and powdered. The futures of plant-derived medicines are likely to have marvelous opportunity for discovering some novel and innovative therapeutic strategies and products. The important secondary metabolites possess some specific pharmacological properties for the human body. Excessive harvesting and habitat destruction have put most medicinal plants at various degrees of risk. To conserve medicinal plants, various in situ and ex situ efforts have been made by world's richest biodiversity regions so that the sustainable utilization of herbal drugs is ensured for the generations to come without compromising the quality and efficiency of the active constituents present in herbal medicines.

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Protein Modificomics

From Modifications to Clinical Perspectives

2019, Pages 1-35

Chapter 1 - Posttranslational Modifications of Proteins and Their Role in Biological Processes and Associated Diseases

Irfan-ur-Rauf Tak *, Fasil Ali †, Jehangir Shafi Dar *, Aqib Rehman Magray *, Bashir A. Ganai *, M.Z. Chishti *

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Abstract

A posttranslational modification (PTM) depicts an imperative means for diversification and regulation of the cellular proteome due to its tremendous scope in various biological processes such as replication, histone modifications, transcription, translation, cell signaling, apoptosis, and cancer, etc. Most PTMs occur in a time- and signal-dependent manner, and determine the overall structure of proteins and also their function in regulating various biological processes. Most PTMs are brought about by small molecular weight functional groups such as phosphate, acyl, acetyl, amide, alkyl, myristoyl, palmitoyl, prenyl, hydroxyl, ubiquitin, and sugars to the amino acid side chains of the protein. Advanced molecular techniques have enumerated more than 200 posttranslational modifications and, in fact, many of them have been discovered recently. Posttranslational modifications can take place at any stage during the maturation of the protein, whereas other modifications usually take place after the process of folding and sorting of proteins and are responsible for their catalytic activity. Study of posttranslational modifications and their mechanism of regulation of various cellular signaling pathways have significant medical implications. Identification, description, and mapping of the posttranslational modifications are very important for discerning their functional implications in a biological context. Therefore, an accurate understanding of protein posttranslational modifications is very important, not only for gaining insight about a multitude of cellular functions and associated diseases, but also regarding drug development for many life-threatening diseases such as neurodegenerative disorders and

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Role of Microbiota in Composting

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Microbiota and Biofertilizers

[Lone Rafiya Majeed](#), [Sumaira Rashid](#), [Heena Nisar Pahalvi](#), [Bisma Nisar](#) & [B. A. Ganai](#)

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Abstract

Waste management in developing countries is so hard to achieve owing to limited resources; composting paves the way due to its adaptability for long-range situations and environmentally sound method as it reduces pollution to a larger extent and also has less potential for environmental degradation comparatively. Decomposition needs direct interaction between the substrates with decomposing substance and the exterior layer of different microbial species. As chemical decomposers, microbiota such as microbes, fungi and actinomycetes break down organic matter to carbon dioxide, water, heat, humus and relatively stable organic end product. Knowledge on waste management demonstrates that composting is an environmentally and economically sound waste treatment process. One of the benefits is that organic waste is converted to a mineral and generates organic fertilizer by application of microorganisms. Composting reduces waste to be dumped in

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Microbiomes and the Global Climate Change

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Climate Change Extenuation by Greenhouse Gas Quenching Microflora

3

Ruqeya Nazir and Riasa Zaffar

Abstract

The major cause of climate change is global warming, which refers to an increase in the concentration of three most important greenhouse gases such as CO₂, CH₄, and N₂O in the atmosphere. Climate change has become a hot topic because of its pervasive detrimental impacts globally. World over, the high level think tanks suggest the remedial measures to the policy makers so as to ameliorate the ramifications of climate change but till now, no suitable method has been devised which can mitigate the effects of climate change. The world is in need of a strategy that will be cost-effective and sustainable. Such techniques can now be used by harnessing the ability of microbes to sequester the greenhouse gases in an irreversible manner, thus aiding in climate change mitigation. The varied biogeochemical processes on earth are wholly and solely dependent upon the metabolic activities of microbes, without which our planet would have been packed with debris. Microbes thriving in the extreme conditions have an inherent ability to sequester CO₂, CH₄, and N₂O. Microorganisms such as *Methylobacillus* and *Methanotrophs* are important carbon recyclers as they use the greenhouse gases as their sole carbon and nitrogen sources which are consequently needed for their metabolic activities. Such bacteria are found in abundance in paddy fields, landfill sites, extreme alkaline environments and geothermal areas. There are some microbes which can convert CO₂ to CaCO₃ that can fetch minerals of economic value. Thus microorganisms have a great potential to fight against global

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Polar Microbes as Climate-Resilient Pathways for Mitigation of Climate Change

7

Shah Ishfaq, Baba Uqab, Jeelani Gousia, Ruqeya Nazir, and
B. A. Ganai

Abstract

Changing climate challenges economic and sustainable growth. IPCC in all its reports has highlighted that climate change has grown its roots and needs immediate attention. For natural environments, documentation of observable impacts from climate change is strongest and much more extensive. Several effects have also been related to climate change on human environments, with a significant or small effect to climate change distinguishable from other factors. Changes in climate have effects throughout all continents and around the world in both ecological and human processes. Soil microbes shape the foundation of the Earth ecological model by regulating biogeochemical processing of essential resources, such as carbon (C) and nitrogen (N). Through part of these biogeochemical processes, bacteria generate and absorb heat-trapping pollutants, such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Regardless of the large carbon deposits sequestered in soils of Arctic, the carbon cycles in these regions do need to be inferred if the effects of global warming are to be correctly measured. Microbial cells inside the permafrost are frozen, hence preserved. While permafrost comprises just about 9% of total land mass on earth, it is assumed that it produces about 25–50% of the soil organic carbon on earth. As it is discharged atmospherically in the form of methane or carbon dioxide, polar carbon has been described as a possible symptom and engine of global warming. Global warming and other human impacts reveal formally frozen ecosystems to increase temperatures which are likely to lead higher performance of accumulated organic material and nutrients. Only small amounts of warming can have significant effects on the structure and function of microbial community in polar soils,

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Ruqeya Nazir and Insha Amin

Abstract

Industrialization along with population explosion in the developed and developing countries has led to accelerated degradation of natural resources on a large scale, ultimately leading to climate change. Since environment is being loaded with a large quantity of pollutants and recalcitrant compounds, environmental remediation has become a major cause of concern today. The advancement of clean technologies for reclamation of environment and sustainable development of society is very vital nowadays. Nanotechnology can help in developing clean and green technology with noteworthy benefits for human health and environment. The field of nanotechnology is now being investigated for its possible solutions for the management and mitigation of polluted water, land and air, and also to enhance the working of traditional technologies which are helpful in the remediation of contaminated environment. Green nanotechnology is the specialized branch of nanotechnology that envisions sustainable development by means of several applications. Various nanoparticles are being utilized increasingly in many areas, but there is mounting interest in the biological and environmental safety linked to their production. Green nanotechnology offers tools and techniques for the transformation of biological systems to green methods to synthesis of nanomaterial, while averting any related toxicity. Due to the large number of harmful chemicals used in the physicochemical synthesis of these nanoparticles, green methods are now being employed which utilize biological sources, such as microorganisms. Through the integration of the principles of green chemistry, engineering and microbiology, green nanotechnology can yield safe and eco-friendly metal nanoparticles that do not use toxic substances in their synthesis. The present chapter highlights the role of

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SOIL BIOREMEDIATION

AN APPROACH TOWARDS
SUSTAINABLE TECHNOLOGY

EDITED BY

DAVID L. JOHNSON AMER HASSIM AND ELXALID HANNOUD
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Chapter 13

Trends in Heavy Metal Remediation

An Environmental Perspective

Baba Uqab Gousia Jeelani Sabeehah Rehman B.A. Ganai
Rugeya Nazir Javid A. Parray

Book Editor(s): Dr. Javid A. Parray

Dr. Abeer Hashem Abd Elkhalek Mahmoud Prof. Riyaz Sayyed

19 March 2021 |

<https://doi.org/10.1002/9781119547976.ch13>

Summary

Industrial pollution is the most serious problem in the environment that requires a solution. A large variety of toxic wastes and chemicals like heavy metals and constant organic pollutants have been detected in a number of biota like water, soil, and air. Among the various pollutants, heavy metals are of serious concern to the environment and human health due to their occurrence as a contaminant, little solubility in the biota, and their carcinogenic, and mutagenic effect. Heavy metal pollution is a widespread problem that disrupts the environment as a result of numerous anthropogenic activities. The heavy metals, moreover, cannot be degraded further to less harmless products and thus persist in the environment for an indefinite period. As a result of this, several remediation methods have been adopted, among them remediation by using



References Related Information

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Microbial Enzyme Assays
for Detecting Heavy
Metal Toxicity

Oladele A. Ogunseitan

Water Encyclopedia. [1]

In Situ Remediation of
Heavy Metals in
Groundwater

James A. Jacobs

Encyclopedia of Water:
Science, Technology, and
Society. [1]

**Biactive Compounds and
Anticarcinogens from Dairy, Marine
and Microenvironmental Sources:
In-vitro Methods, Analytical Techniques,
and Potential Health Prospects**



Edited by David S. Horowitz

Technological Aspects of Bioactive Compounds and Nutraceuticals From Microbial Sources

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CHAPTER CONTENTS

ABSTRACT

17.1. INTRODUCTION

17.1.1. Importance of Bioactive Compounds and Nutraceuticals in Industries

17.2. MICROBES AS POTENTIAL SOURCES OF BIOACTIVE COMPOUNDS

17.3. TECHNOLOGICAL ACHIEVEMENTS FOR EXTRACTION AND PROCESSING OF BIOACTIVES AND NUTRACEUTICALS

17.3.1 Conventional methods

17.3.2. Non-conventional or advanced green methods

17.4. ANALYTICAL TECHNIQUES FOR ANALYSIS OF BIOACTIVE COMPOUNDS DERIVED FROM MICROBIAL SOURCES

17.5. INCORPORATION OF MICROBE DERIVED BIOACTIVE COMPOUNDS AND NUTRACEUTICALS INTO FOOD

17.6. CHALLENGES AND FUTURE PERSPECTIVES

17.7 REFERENCES

ABSTRACT

Natural bioactive compounds and nutraceuticals confer health-promoting and medical benefits to humans. There is growing demand for such compounds and

CHAPTER 12

Bio-Indicator Species and Their Role in Monitoring Water Pollution

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Impact of Climate Change on Freshwater Ecosystem and Its Sustainable Management



Birjees Hassan, Humaira Qadri, Md. Niamat Ali, Nissar Ahmad Khan, and Ali Mohd Yattoo

Abstract Freshwater ecosystems are vital for global biodiversity and ecosystem services. Freshwater ecosystems are susceptible to the impacts of environmental change, which may cause irreversible damage to these ecosystems upon which huge amount of biodiversity and ecosystem services are dependent. Within the next few decades the climate change will have considerable ecological impacts on most of the fresh water ecosystems as per the current climatic predictions. Different freshwater ecosystems will be affected differently by climate change. One of the most important and major impact to be caused by climate change will be on fresh water flow regime. The speed of climate change will be abrupt and uneven rather than slow and even. Impacts caused by climate change on freshwater ecosystems will be visible both physically and chemically. It is very hard and more complex to forecast the impact on freshwater resources due to climate change. In most of the cases, climate change together with other man made pressures will cause much damage to freshwater ecosystems. It is very difficult to predict impact of climate change on freshwater ecosystems in the next few decades using current global climate models. Rather than focusing on impact assessment a risk based approach should be adopted to assess and respond to climate change. A number of measures are required to protect freshwater ecosystems such as reducing extraction of water from ground and surface water, maintaining water flows, management of macrophytes, artificial

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105

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Chapter 2

Effect of Pesticides on Fish Fauna: Threats, Challenges, and Possible Remedies



Shafat Ali, Adil Farooq Wali, Ali Mohd Yatou, Sabhiya Majid, Saiema Rasool, Rehan Khan, Md Niamat Ali, Jayalid Ahmad Wani, Sanah Farooq, Shabhat Rasool, Hilal Ahmad Wani, and Muneeb U. Rehman

2.1 Introduction

Pesticides are the chemical compounds with toxic nature purposefully employed to destroy a range of harmful organisms. Pesticides not only encompass insecticides but also fungicides, herbicides, and those substances that are toxic to pests (Matthews 2006). The major proportion of pesticides synthesized all over the world is utilized

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27

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Chapter 13

miRNAs: the genetic regulators of immunity

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13.1 Introduction

The development and function of immune cells are vital for host defense against external and internal threats and for immune resolution following the elimination of threats, which requires rapid changes in the transcriptome and proteome. These changes are tightly regulated at both the transcriptional and posttranscriptional levels, where microRNAs (miRNAs) have been demonstrated to be crucial molecular players. miRNAs are small noncoding RNAs (about 18–22 nucleotides in length) produced by a multistep process involving a series of enzymes and proteins (Dhillon, Bhattacharyya & Fedipowicz, 2007). The genes encoding miRNAs are transcribed by either RNA polymerase II or III as primary miRNAs (pri-miRNAs) containing a cap structure at the 5' end and polyadenylation at the 3' end (Lee et al., 2004). The nuclear microprocessor complex, composed of the ribonuclease (RNase) III enzyme Drosha and the RNA-binding protein DGCR8, processes pri-miRNAs into the precursor miRNAs (pre-miRNAs) which are exported into the cytoplasm facilitated by Exportin 5 and the GTP-binding nuclear binding protein RAN-GTP (Bokar et al., 2003; Cogoli et al., 2003; Denti, Tappin, Stasiv, Kettner, & Hannon, 2004; Gregory et al., 2004; Lee et al., 2003; Miska et al., 2004). RNase III enzyme Dicer then cleaves pre-miRNAs into mature miRNA duplexes through binding to the two-nucleotide overhang at their 3' end generated by Drosha (Goussouri, 2003; Miska et al., 2004). One strand of the miRNA duplex is usually incorporated into the miRNA-induced silencing complexes (miRISCs) through the Argonaute (Ago) proteins, which guide the binding of miRNAs to complementary sites mainly located in the 3'

Next Generation Research in Aquaculture

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Immunogenetics: A Molecular and Clinical Overview

A Molecular Approach to Immunogenetics

Volume I

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Immunogenetics: A Molecular and Clinical Overview

Clinical Applications of Immunogenetics

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Past, Present and Future of Micronucleus Test (MNT) and its Role in Fish Toxicogenon

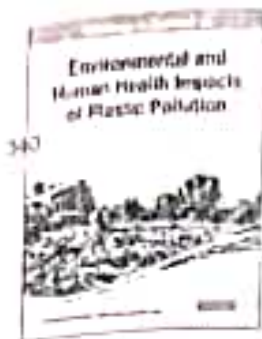
Md. N

Abstract

The rapidly developing field of toxicogenomics is the application of genomic address questions in the field of toxicology, expected to have a major impact fields of genotoxicity and carcinogenicity. Genotoxicity is a destructive effect genotoxins on cellular genetic material (DNA, RNA) destroying its integrity include physical (ionizing radiation), chemical (EMS) and biological (reserp etc.) agents causing mutations. Nowadays, genotoxicity assays have become component of regulatory requirement. In-vitro as well as in-vivo methods evaluation of genotoxicity or mutagenicity, exert numerous genotoxicologic Different endpoints must be taken into considerations for the assessment of One such vital end point, the micronucleus (MN) test (MNT) is always included genotoxicity test guidelines for long time in many classes of genotoxins. Induction is a key characteristic of genotoxic compounds and analysis of micronuclei resulting from DNA strand breakage (clastogens) or to investigate genoprotection recent years, each of the in-vivo and in-vitro micronucleus assay has become a

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Environmental Phthalate Exposure in Relation to Reproductive Outcomes and Other Health Endpoints

15

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Chapter 17 Environmental Phthalate Exposure in Relation to Reproduction Outcomes and Health Endpoints

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ABSTRACT

Environmental pollutants, like xenobiotic substances released as byproducts of anthropogenic activities, naturally lead to pollution of the environment. They negatively affect the environment through unfavorable impacts on growth, development, and reproduction of organisms including humans. One of the outstanding examples of xenobiotics or endocrine disrupting compounds (EDCs) such as phthalate esters (PEs), which have the efficacy to disturb numerous biological systems including the invertebrate, reptilian, avian, aquatic, and also the mammalian systems. Phthalates are family of xenobiotic hazardous compounds amalgamating in plastics to intensify their plasticity, flexibility, longevity, versatility, and durability. Ignoring the rising issue on the hazardous nature of various phthalates and their metabolites, ruthless usage of phthalates as plasticizers in plastics and as additives in innumerable consumer products continues due to their low eminent properties, their cost-effectiveness, and lack of suitable alternatives. Globally epidemiological human studies showed various phthalates and their metabolites ingested passively by man from the general environment, foods, drinks, breathing air, and routine household products cause various dysfunctions. This comprehensive chapter on the hazards of phthalates would benefit the general population, academia, scientists, clinicians, environmentalists, and law or policymakers to decide upon whether usage of phthalates to be continued swiftly without sufficient deceleration or regulated by law or to be phased out from earth forever.

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Chapter 8

Vermicomposting: An Eco-Friendly Approach for Recycling/Management of Organic Wastes



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167

Honey: Types, Composition and Antimicrobial Mechanisms

Zarka Zaheen, Ali Mohd Yattoo, Shafat Ali, Md. Niamat Ali, Sabhiya Majid, Shabhat Rasool, Shahzada Mudasir Rashid, Sheikh Bilal Ahmad, Manzoor ur Rahman Mir, and Uzma Zehra

Abstract

Honey has been broadly recognized as a source of nourishment and medic by both old and new generations. It has been utilized by people to treat numerous illnesses through topical application for at least 2700 years, but recent research have revealed the antiseptic and antimicrobial activities of honey. It has

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Bacterial Fish Diseases

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Potent Biotechnological Applications of Psychrozymes

18

Burhan Hamid

Abstract

Psychrophilic yeasts possess the ability to live in extreme environmental condition (i.e. low temperature). This property makes them more valuable and more significant as they are adapted to these harsh conditions. It is well-known that major area of the earth is covered with cold environments. Psychrophilic yeasts are molecularly adapted to these cold conditions; due to these reasons researchers are getting attracted towards exploring adaptability of psychrophilic yeasts. Psychrophilic yeasts are capable of producing extremozymes having utmost stability and activity at low temperatures. Psychrozymes produced by psychrophilic yeasts show maximal activity at lower temperatures, they are having potential application in different fields. Psychrophilic enzymes produced by yeasts have proven to be economically feasible at industrial level and also keep process contamination free. These enzymes possess utility in different industries like food, pharmaceutical, detergent, leather, textile, biomedical, brewing for multiple low temperature process. The few potential enzymes secreted by psychrophilic yeasts are amylases, proteases, pectinases, lipases, lactases, etc., they are known as a valuable tool for various biotechnological processes. Climate change has directly or indirectly influenced the diversity of psychrophilic microorganisms including yeasts. Global warming leads to the negative impact on the habitats of cold-loving microorganisms and that is a matter of concern for researchers. In this chapter, industrial and biotechnological aspect of psychrophilic yeasts and their cold-active enzymes are reviewed and discussed. The focus has been given to their application in different sectors like food, pharmaceutical, detergent, leather, textile, biomedical, molecular, brewing, waste management.

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349

Nanoremediation: A Sustainable Reclamation Method for Future Deployment

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ABSTRACT

Nanotechnology has fascinated scientists and researchers for exploitation of unparalleled biological, physical, and chemical characteristics of nanoparticles. Nano-formed compounds are developed for utilization in a diverse number of fields from medicine to the space exploration. Because of high surface area to volume ratio, size-dependent attributes and high reactivity,

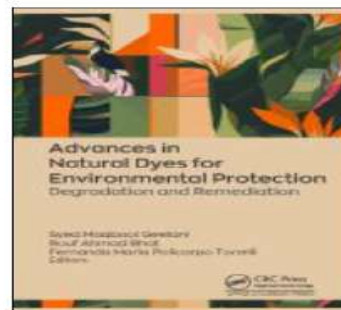
Nano-Bioremediation for Water and Soil Treatment: An Eco-Friendly Approach.
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Advances in Natural Dyes for Environmental Protection

Degradation and Remediation

Editors: Syed Maqbool Geelani, PhD
Rouf Ahmad Bhat, PhD
Fernanda Maria Policarpo Tonelli, PhD

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REVIEWS

"The most important aspects regarding textile pollution caused by dyes, its remediation, natural dyes as sustainable alternative to synthetic ones, challenges, and the market for the field are covered. . . . Comprehensive and up to date. The editors deserve to be complimented for their sincere

6. Innovative Sustainable Application of Plant-Based Colorants in Cosmetics
Shazia Abrar, Shahid Adeel, Shumaila Kiran, Amina Younas, Fatima Batool, and Somayeh Mirnezhad

7. Dyeing of Wool and Wool Blends with Natural and Synthetic Dyes
Tanveer Hussain Bokhari, Muhammad Usama Shabbir, Shahid Adeel, Muhammad Usman, and Amnah Yousaf

8. Applications of Conventional and Non-Conventional Dyeing Technologies for Textiles
Yashodhara Goswami and Ishani Chakrabartty

9. Eco-Friendly Dyeing Technologies for Cellulosic, Animal, and Synthetic Fibers
Mehreen Shah and Sirajuddin Ahmed

10. Challenges in Using Natural Dyes in the Global Market
Benjamin Siddiqui, Atif Husain, Malik Nasibullah, and Naseem Ahmad

11. Bottlenecks in Sustainable Treatment of Wastewaters Using Physico-Chemical Processes and Future Prospectus
Younis Ahmad Hajam, Neelam Bhatti, and Rajesh Kumar

12. Microbe-Mediated Remediation of Dyes
Burhan Hamid, Neesa Majeed, Syed Nasir Ahmad, Ali Mohd Yatoo, Zaffar Bashir, Tawfeeqa Hamid, and Zahoor Ahmad Bhat

13. The Global Scenario for the Management of Dyes: Recent Advances in Natural and Man-Made Dyes
Ahmed Albahnasawi, Motasem Y.D. Alazaiza, Ebubekir Yüksel, Mesut Tekbas, Ercan Gürbulak, and Murat Eyyvaz

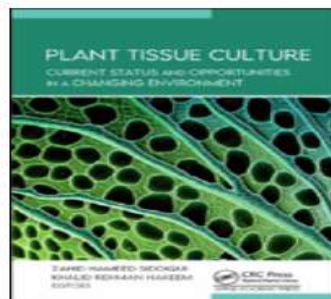
Index

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Plant Tissue Culture Current Status and Opportunities in a Changing Environment

Editors: Zahid Hameed Siddiqui, PhD
Khalid Rehman Hakeem, PhD

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illustrations

Plants are sessile and constantly exposed to changing environmental conditions. Seasonal cues govern plant growth, development, and reproduction. In this era of climate change, the environment is unstable and takes a toll on the productivity of plants. This new book, **Plant Tissue Culture: Current Status and Opportunities in a Changing Environment**, explores this unique area of

This book will prove beneficial for plant biotechnologists, environmentalists, ecologists, and scientists in enhancing their understanding of the complexities of climate change under in vitro conditions.

CONTENTS:

Preface

1. History of Plant Tissue Culture

Yogesh Chandrakant Suryawanshi

2. Recent Advances and Future Status of Plant Tissue Culture

Komal Shoukat, Muhammad Mahran Aslam, Zarrin Fatima Rizvi, Nazir Ahmed, Saman Zulfiqar, Iram Naz Sherazi, Javaria Fazal, Aniq Bashir, Sajjad Hyder, Samiya Rehman, and Jawad Ali

3. Application of Synthetic Seeds and Somatic Embryogenesis in Changing Climate Conditions

Irfan Bashir Ganie, Zishan Ahmad, and Anwar Shahzad

4. Influence of Phytohormones in Plant Tissue Culture

Zarrin Fatima Rizvi, Wajiha Sarfraz, Muhammad Mahran Aslam, and Niaz Hussain Khohro

5. Asymbiotic Seed Germination and Micropropagation of Some Orchids of West Bengal, India

Soumi Bhattacharyya, Anindya Sundar Ray, Nirmalya Banerjee, and Chowdhury Habibur Rahaman

6. Plant Tissue Culture and Its Role in Plant Breeding Programs

Zahara Sultan, Najeebul Tarfeen, Burhan Hamid, Zaffar Bashir, and Tufail Ahmad Bhat

7. Generation of Composite Cowpea Plants Expressing a STOP1 Transcription Factor

Md. Ramiz Raza

8. The Role of Tissue Culture and Endophytes in Plant Secondary Metabolites Synthesis in Changing Environmental Conditions

Sahiba Tabassum, Zishan Ahmad, Anwar Shahzad, Adil Majeed, and Muhammad



Burhan Hamid and Fayaz A. Mohiddin

Abstract

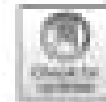
Microorganisms living in extreme environmental conditions (extremophiles) are potential source of extremozymes; they possess utmost stability under extreme environmental conditions. Cold-active enzymes are extremozymes produced by the psychrophiles (extremophiles) and have attracted much attention as biocatalysts due to their capacity to resist unfavourable reaction conditions in the industrial process. Cold-active enzymes possess wide applications in the food industry; these enzymes are not only secreted by bacteria but also from yeasts and moulds. Although enzymes are derived from plant and animal sources, cold-active microbial enzymes have taken advantage, due to their productivity and thermostability. Psychrophilic microorganisms produce a wide range of cold-active enzymes with immune application in food processing. The use of β -galactosidase for the removal of lactose from refrigerated milk, application of pectinase for the reduction of viscosity and turbidity in chilled juice and use of amylase for hydrolysis of polysaccharides in starch processing industries and processing of meat with the help of cold-active proteases are the representative examples of application of cold-active enzymes. Cold-active enzymes possess exceptional molecular flexibility that has opened up newer areas of applications. In food processing industries, cold-active pectinases have been used for the removal of pectin which is important in fruit juice and wine processing, coffee and tea processing and macerating of plants and vegetable tissue, for degumming of plant fibres, for extracting vegetable oils and for adding poultry feed and in the alcoholic beverages. To fulfil the demand of industries, enzyme technology needs extension of biotechnological approach in terms of both quality and quantity. The potential of cold-active enzymes provides numerous opportunities for industrial

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383



Harnessing Soil Rhizobacteria for Improving Drought Resilience in Legumes

8

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Contents

| | | |
|-------|--|-----|
| 8.1 | Introduction | 237 |
| 8.2 | Agricultural Importance of Legumes | 238 |
| 8.2.1 | Global Context: Rationale for Sustainable Intensification of Legumes in Cropping Systems | 240 |
| 8.3 | Implications of Drought Stress on Legumes | 249 |
| 8.3.1 | Implication of Water Stress on N-Fixation | 250 |
| 8.4 | Association of Legumes with Soil Rhizobacteria | 251 |
| 8.5 | Soil Rhizobacteria in Relation to Drought Stress Amelioration | 254 |
| 8.6 | Emerging Perspectives of Harnessing Soil Rhizobacteria | 258 |
| 8.6.1 | Selection for Differential Genotypic Response to Rhizobacterial Inoculation | 259 |
| 8.6.2 | Selection for Competitive Rhizobacterial Strains | 261 |
| 8.6.3 | Identification of Adaptive Crop-Microbial Associations | 263 |
| 8.6.4 | Genetic Modification of Rhizobacteria | 263 |
| 8.7 | Conclusion | 263 |
| 8.8 | Future Prospective | 264 |
| | References | 265 |

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