Application of Enzymes in Textile Functional Finishing

| Chapter | First Online: 11 June 2020

| pp 115–127 | Cite this chapter

Advances in Functional Finishing of Textiles

Shrabana Sarkar, Karuna Soren, Priyanka Chakraborty & Rajib Bandopadhyay

Part of the book series: Textile Science and Clothing Technology ((TSCT))

Abstract

Textile is one of the strongest economic pillars of any developing country. There is increased demand of eco-friendly and comfortable wearer with improving quality, which comes due to advanced and environment friendly finishing. Enzymes plays important role in bio-processing of textile. Enzymes are there from nineteenth century but less than only two decades ago it was first used in textile processing. Enzymes increase the functionality by minimising the strength and effort. Chemical textile processing is already at hand from very first day, but that cause hazard. In place of that, enzymatic

Serial No. 68

Department of Fibers and Textile Processing Technology, Institute of Chemical Technology, Mumbai, India
Mohammad Shahid

Department of Fibers and Textile Processing Technology, Institute of Chemical Technology, Mumbai, India
Ravindra Adivarekar

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Sarkar, S., Soren, K., Chakraborty, P., Bandopadhyay, R. (2020). Application of Enzymes in Textile Functional Finishing. In: Shahid, M., Adivarekar, R. (eds) Advances in Functional Finishing of Textiles. Textile Science and Clothing Technology. Springer, Singapore. https://doi.org/10.1007/978-981-15-3669-4_5

Serial No. 68

DOI
https://doi.org/10.1007/978-981-15-3669-4_5

Published
11 June 2020

Publisher Name
Springer, Singapore

Print ISBN
978-981-15-3668-7

Online ISBN
978-981-15-3669-4

eBook Packages
Engineering
Engineering (R0)

Publish with us

Policies and ethics

46. CN106758261A.https://patents.google.com/patent/CN106758261A/en?q=microbial&q=enzyme&q=textile+finishing&before=priority:20190101&after=priority:20150101

47. CN105951434B.https://patents.google.com/patent/CN105951434B/en?q=microbial&q=enzyme&q=textile+finishing&before=priority:20190101&after=priority:20150101

48. CN108251319A.https://patents.google.com/patent/CN108251319A/en?q=microbial&q=enzyme&q=textile+finishing&before=priority:20190101&after=priority:20150101

49. CN109457468A.https://patents.google.com/patent/CN109457468A/en?q=microbial&q=enzyme&q=textile+finishing&before=priority:20190101&after=priority:20150101

Acknowledgements

Authors are thankful to UGC-Center of Advanced Study, Department of Botany, The University of Burdwan for pursuing research activities. SS is thankful to SVMCM-Non Net fellowship for the financial assistance.

Author information

Authors and Affiliations

UGC-Center of Advanced Study, Department of Botany, The University of Burdwan, Golapbag, Burdwan, West Bengal, 713104, India

Shrabana Sarkar, Karuna Soren, Priyanka Chakraborty & Rajib Bandopadhyay

Corresponding author

Correspondence to Rajib Bandopadhyay .

Serial No. 68

Editor information

Editors and Affiliations

Department of Fibers and Textile Processing Technology, Institute of Chemical Technology, Mumbai, India
Mohammad Shahid

Department of Fibers and Textile Processing Technology, Institute of Chemical Technology, Mumbai, India
Ravindra Adivarekar

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Sarkar, S., Soren, K., Chakraborty, P., Bandopadhyay, R. (2020). Application of Enzymes in Textile Functional Finishing. In: Shahid, M., Adivarekar, R. (eds) Advances in Functional Finishing of Textiles. Textile Science and Clothing Technology. Springer, Singapore. https://doi.org/10.1007/978-981-15-3669-4_5

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-981-15-3669-4_5	11 June 2020	Springer, Singapore

Leaf Anatomical Adaptations of Mangroves

| Reference work entry | First Online: 19 May 2021

| pp 1063–1077 | Cite this reference work entry

Handbook of Halophytes

Saikat Naskar, Subrata Mondal & Sukanta Ankure

Abstract

The leaf of mangroves is adapted to conserve water and to regulate toxic salt within the cells. Thick cuticle on the leaf surface prevents excessive water loss and develops cuticular extension on stomatal pore. Some closely related species display different types of stomata due to their different habitat preferences. Several mangrove species open their stomata at daytime to gain carbon from atmosphere in the expense of precious water. Mangrove leaves can absorb alternative source of water such as dew, moisture, etc. to compensate water loss during stomatal opening. The isotopic enrichment of mangrove leaf water ($\delta^{18}O$ and $\delta^{2}H$) during photosynthesis is concomitant with stomatal density, size, stomatal cavity volume, and distribution. Water storage tissue maintains water balance of the mesophyll when rate of water loss exceeds water transport. High salinity induces increased leaf succulence to dilute salt into the cells to minimize cellular toxicity.

Marius-Nicusor Grigore

Rights and permissions

Copyright information

About this entry

Cite this entry

Naskar, S., Mondal, S., Ankure, S. (2021). Leaf Anatomical Adaptations of Mangroves. In: Grigore, MN. (eds) Handbook of Halophytes. Springer, Cham.
https://doi.org/10.1007/978-3-030-57635-6_36

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-3-030-57635-6_36

Published
19 May 2021

Publisher Name
Springer, Cham

Print ISBN
978-3-030-57634-9

Online ISBN
978-3-030-57635-6

eBook Packages
Biomedical and Life Sciences
Reference Module Biomedical and Life Sciences

Publish with us

Policies and ethics

Article CAS PubMed Google Scholar

Yuan, F., Chen, M., Leng, B. Y., & Wang, B. S. (2013). An efficient autofluorescence method for screening *Limonium bicolor* mutants for abnormal salt gland density and salt secretion. *South African Journal of Botany, 88*, 110–117. https://doi.org/10.1016/j.sajb.2013.06.007.

Article CAS Google Scholar

Yuan, F., Leng, B., & Wang, B. (2016). Progress in studying salt secretion from the salt glands in Recretohalophytes: How do plants secrete salt? *Frontiers in Plant Science,* 7, 997. https://doi.org/10.3389/fpls.2016.00977.

Article Google Scholar

Author information

Authors and Affiliations

Department of Botany, The University of Burdwan, Burdwan, West Bengal, India
Saikat Naskar, Subrata Mondal & Sukanta Ankure

Corresponding author

Correspondence to Saikat Naskar .

Editor information

Editors and Affiliations

Faculty of Biology, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
Marius-Nicusor Grigore

Section Editor information

Faculty of Biology, Alexandru Ioan Cuza University of Iași, Iasi, Romania

Serial No. 70

Precision Agriculture and Sustainable Crop Production

Editors:
Prof. H.K. Chourasia
University Department of Botany
T.M. Bhagalpur University, Bhagalpur-812 007

Prof. Krishnendu Acharya,
Centre of Advanced Study, Department of Botany
University of Calcutta, Kolkata-700 019

Dr. Vivek Kumar Singh
University Department of Botany
T.M. Bhagalpur University, Bhagalpur-812 007

Today & Tomorrow's Printers and Publishers
4436/7, Ansari Road, Daryaganj, New Delhi - 110 002
Ph : 23242621; 23241021; Fax 23242621;
E-mail: ttppindia@gmail.com; info@ttppbooks.com
Web : www.ttpp.in

Deciphering the Molecular Mechanisms of Biotic Stress Tolerance Unravels the Mystery of Plant-Pathogen Interaction

| Chapter | First Online: 13 April 2021

| pp 295–316 | Cite this chapter

Sustainable Agriculture Reviews 51

Nibedita Chakraborty, Priyanka Chakraborty, Rajib Bandopadhyay & Jolly Basak

Part of the book series: Sustainable Agriculture Reviews ((SARV,volume 51))

Abstract

Plants are always exposed to the wide variety of pathogens. In compatible interaction, pathogen can successfully invade into the host plant by manipulating host immune system and causes plant disease. On the other hand, during incompatible interaction plant recognizes variable pathogen elicitor molecules and induces its defense response. The molecular mechanism of plant-pathogen interaction is very specific, complex and dynamic. A plethora of research has explored the multifaceted defense mechanisms of

Vineet Kumar

CNRS, IRD, INRAE, Coll France, CEREGE, Aix-Marseille University, Aix-en-Provence, France

Eric Lichtfouse

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Chakraborty, N., Chakraborty, P., Bandopadhyay, R., Basak, J. (2021). Deciphering the Molecular Mechanisms of Biotic Stress Tolerance Unravels the Mystery of Plant–Pathogen Interaction. In: Guleria, P., Kumar, V., Lichtfouse, E. (eds) Sustainable Agriculture Reviews 51. Sustainable Agriculture Reviews, vol 51. Springer, Cham. https://doi.org/10.1007/978-3-030-68828-8_10

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-030-68828-8_10	13 April 2021	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-030-68827-1	978-3-030-68828-8	Biomedical and Life Sciences Biomedical and Life Sciences (R0)

Article CAS PubMed PubMed Central Google Scholar

Zipfel C, Kunze G, Chinchilla D, Caniard A, Jones JDG, Boller T, Felix G (2006) Perception of the bacterial PAMP EF-Tu by the receptor EFR restricts *Agrobacterium*-mediated transformation. Cell 125:749–760

Article CAS PubMed Google Scholar

Author information

Authors and Affiliations

Department of Biotechnology, National Institute of Technology, Durgapur, West Bengal, India
Nibedita Chakraborty

UGC-Center of Advanced study, Department of Botany, The University of Burdwan, Bardhaman, West Bengal, India
Priyanka Chakraborty & Rajib Bandopadhyay

Department of Biotechnology, Sikhsha Bhavan, Visva-Bharati, Santiniketan, West Bengal, India
Jolly Basak

Corresponding author

Correspondence to Jolly Basak .

Editor information

Editors and Affiliations

Plant Biotechnology and Genetic Engineering Lab, Department of Biotechnology, DAV University, Jalandhar, Punjab, India
Praveen Guleria

Department of Biotechnology, School of Bioengineering and Biosciences, Lovely Professional University, Phagwara, India

ScienceDirect

Nanobiotechnology

Microbes and Plant Assisted Synthesis of Nanoparticles, Mechanisms and Applications

2021, Pages 283-301

Chapter 18 - Metal recovery using nanobiotechnology

Krishnendu Majhi, Moitri Let, Ashutosh Kabiraj, Shrabana Sarkar, Urmi Halder, Bhramar Dutta, Raju Biswas, Rajib Bandopadhyay

https://doi.org/10.1016/B978-0-12-822878-4.00018-3

Abstract

Nowadays, nanoscale matter has started a revolution in manufacturing and industrialization processes like metal recovery. However, the chemical synthesis of nanoparticles has several disadvantages such as high initial capital cost, hazardous environmental effects, and slow metal recovery. To overcome these situations, the green synthesis of nanoparticles has gained attention due to its cost-effectiveness and ecofriendly nature. In the present era, nanobiotechnology is a major approach to recover several valuable metals. Different organisms like plants, fungi, algae, and bacteria have the ability to synthesize nanoparticles. Polyphenolic compounds from plant extracts have great antioxidant and reducing properties that can enable the reduction of metal ions into zero-valent metal atoms. NADH-dependent nitrate reductase enzymes act as a stabilizer in the formation of nanoparticles. Microbes like Pseudomonas, *Bacillus*, Shewanella, Geobacter, Klebsiella, and Desulfovibrio are capable of synthesizing nanoparticles and recover valuable metals like platinum, palladium, gold, silver, selenium, uranium, and copper.

Deciphering the Molecular Mechanisms of Biotic Stress Tolerance Unravels the Mystery of Plant-Pathogen Interaction

| Chapter | First Online: 13 April 2021

| pp 295–316 | Cite this chapter

Sustainable Agriculture Reviews 51

Nibedita Chakraborty, Priyanka Chakraborty, Rajib Bandopadhyay & Jolly Basak

Part of the book series: Sustainable Agriculture Reviews ((SARV,volume 51))

Abstract

Plants are always exposed to the wide variety of pathogens. In compatible interaction, pathogen can successfully invade into the host plant by manipulating host immune system and causes plant disease. On the other hand, during incompatible interaction plant recognizes variable pathogen elicitor molecules and induces its defense response. The molecular mechanism of plant-pathogen interaction is very specific, complex and dynamic. A plethora of research has explored the multifaceted defense mechanisms of

Vineet Kumar

CNRS, IRD, INRAE, Coll France, CEREGE, Aix-Marseille University, Aix-en-Provence, France

Eric Lichtfouse

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Chakraborty, N., Chakraborty, P., Bandopadhyay, R., Basak, J. (2021). Deciphering the Molecular Mechanisms of Biotic Stress Tolerance Unravels the Mystery of Plant–Pathogen Interaction. In: Guleria, P., Kumar, V., Lichtfouse, E. (eds) Sustainable Agriculture Reviews 51. Sustainable Agriculture Reviews, vol 51. Springer, Cham. https://doi.org/10.1007/978-3-030-68828-8_10

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-030-68828-8_10	13 April 2021	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-030-68827-1	978-3-030-68828-8	Biomedical and Life Sciences Biomedical and Life Sciences (R0)

Article CAS PubMed PubMed Central Google Scholar

Zipfel C, Kunze G, Chinchilla D, Caniard A, Jones JDG, Boller T, Felix G (2006) Perception of the bacterial PAMP EF-Tu by the receptor EFR restricts *Agrobacterium*-mediated transformation. Cell 125:749–760

Article CAS PubMed Google Scholar

Author information

Authors and Affiliations

Department of Biotechnology, National Institute of Technology, Durgapur, West Bengal, India
Nibedita Chakraborty

UGC-Center of Advanced study, Department of Botany, The University of Burdwan, Bardhaman, West Bengal, India
Priyanka Chakraborty & Rajib Bandopadhyay

Department of Biotechnology, Sikhsha Bhavan, Visva-Bharati, Santiniketan, West Bengal, India
Jolly Basak

Corresponding author

Correspondence to Jolly Basak .

Editor information

Editors and Affiliations

Plant Biotechnology and Genetic Engineering Lab, Department of Biotechnology, DAV University, Jalandhar, Punjab, India
Praveen Guleria

Department of Biotechnology, School of Bioengineering and Biosciences, Lovely Professional University, Phagwara, India

Beneficial Role of Plant Growth-Promoting Rhizobacteria in Bioremediation of Heavy Metal(loid)-Contaminated Agricultural Fields

| Chapter | First Online: 01 May 2021

| pp 441–495 | Cite this chapter

Microbes: The Foundation Stone of the Biosphere

Krishnendu Pramanik, Sandipan Banerjee, Debosmita Mukherjee, Kunal Kumar Saha, Tushar Kanti Maiti & Narayan Chandra Mandal

Part of the book series: Advances in Environmental Microbiology ((AEM,volume 8))

Abstract

The synergy of plants and microbes is one of the most interesting parts of holobiont research that yet have to be unwrapped before we can understand its implications in agriculture. Environmental stresses on plant ecology have further added to our curiosity in this context. Microorganisms are key players in benefitting plant health. This chapter mainly covers heavy metal and metalloid (HM)-induced phytotoxicity in different crops.

Serial No. 74

Authors and Affiliations

Mycology and Plant Pathology Laboratory, Department of Botany, Siksha Bhavana, Visva-Bharati, Santiniketan, Birbhum, West Bengal, India

Krishnendu Pramanik, Sandipan Banerjee, Debosmita Mukherjee, Kunal Kumar Saha & Narayan Chandra Mandal

Microbiology Laboratory, Department of Botany, The University of Burdwan, Purba Bardhaman, West Bengal, India

Tushar Kanti Maiti

Corresponding authors

Correspondence to Krishnendu Pramanik or Narayan Chandra Mandal .

Editor information

Editors and Affiliations

Cincinnati, OH, USA

Christon J. Hurst

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Pramanik, K., Banerjee, S., Mukherjee, D., Saha, K.K., Maiti, T.K., Mandal, N.C. (2021). Beneficial Role of Plant Growth-Promoting Rhizobacteria in Bioremediation of Heavy Metal(loid)-Contaminated Agricultural Fields. In: Hurst, C.J. (eds) Microbes: The

Foundation Stone of the Biosphere. Advances in Environmental Microbiology, vol 8. Springer, Cham. https://doi.org/10.1007/978-3-030-63512-1_22

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-3-030-63512-1_22

Published
01 May 2021

Publisher Name
Springer, Cham

Print ISBN
978-3-030-63511-4

Online ISBN
978-3-030-63512-1

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

Allelochemicals: An Emerging Tool for Weed Management

| Chapter | First Online: 19 January 2021

| pp 249–259 | Cite this chapter

Evidence Based Validation of Traditional Medicines

Chandan Das, Avishek Dey & Abhijit Bandyopadhyay

Abstract

Allelopathy represents a mechanism by which plant releases biochemical compounds that influence cell division, seed germination, physiology, overall growth, development, and survival of other plants. Presently, allelochemicals find applications in crop field, especially in weed management, and in agricultural systems as growth regulator, as well as herbicides. Applying such allelochemicals is safer than synthetic harmful chemicals as these natural biodegradable phytometabolites hardly leave residual toxicity on targets. Allelopathy is mostly reported to produce inhibitory action of allelochemicals against targeted weeds and promises potent alternative to chemical herbicides. This article

CAS Google Scholar

Wang Q, Li ZH, Ruan X et al (2010) Phenolics and plant allelopathy. Molecules 15(12):8933–8952. https://doi.org/10.3390/molecules15128933

Article CAS PubMed PubMed Central Google Scholar

Weston LA (1996) Utilization of allelopathy for weed management in agro-ecosystems. Agron J 88:860–866

Google Scholar

Weston LA, Duke SO (2003) Weed and crop allelopathy. Crit Rev Plant Sci 22(3-4):367–389

CAS Google Scholar

Xuan T, Eiji T, Hiroyuki T et al (2003) Identification of potential allelochemicals from kava (*Piper methysticum* L.) root. Allelopath J 12:197–203

Google Scholar

Yu JQ, Matsui Y (1994) Phytotoxic substances in the root exudates of *Cucumis sativus* L. J Chem Ecol 20:21–31

CAS PubMed Google Scholar

Author information

Authors and Affiliations

Plant Genetics and Molecular Biology Unit, Department of Botany, University of Burdwan, Burdwan, West Bengal, India

Chandan Das & Abhijit Bandyopadhyay

Department of Botany, Ramananda Centenary College, Purulia, West Bengal, India

Serial No. 75

Avishek Dey

Corresponding author

Correspondence to Abhijit Bandyopadhyay .

Editor information

Editors and Affiliations

Pharmaceutical Technology, Jadavpur University, Kolkata, West Bengal, India
Subhash C. Mandal

NEF College of Pharmacy, Guwahati, Assam, India
Raja Chakraborty

Faculty of Pharmaceutical Science, Assam down town University, Guwahati, Assam, India
Saikat Sen

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Das, C., Dey, A., Bandyopadhyay, A. (2021). Allelochemicals: An Emerging Tool for Weed Management. In: Mandal, S.C., Chakraborty, R., Sen, S. (eds) Evidence Based Validation of Traditional Medicines. Springer, Singapore. https://doi.org/10.1007/978-981-15-8127-4_12

Serial No. 75

DOI
https://doi.org/10.1007/978-981-15-8127-4_12

Published
19 January 2021

Publisher Name
Springer, Singapore

Print ISBN
978-981-15-8126-7

Online ISBN
978-981-15-8127-4

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Chapter

79Unveiling the Mechanism of Transcriptional and Epigenetic Responses in Plants under Heavy Metal Stress: An Update

By Samrat Banerjee (/search?contributorName=Samrat Banerjee&contributorRole=author&redirectFromPDP=true&context=ubx), Mehali Mitra (/search?contributorName=Mehali Mitra&contributorRole=author&redirectFromPDP=true&context=ubx), Puja Agarwal (/search?contributorName=Puja Agarwal&contributorRole=author&redirectFromPDP=true&context=ubx), Sujit Roy (/search?contributorName=Sujit Roy&contributorRole=author&redirectFromPDP=true&context=ubx)

Book Heavy Metal Toxicity in Plants (https://www.taylorfrancis.com/books/mono/10.1201/9781003155089/heavy-metal-toxicity-plants?refId=70ace9d3-8031-44c5-bbb9-228b376535c4&context=ubx)

Edition	1st Edition
First Published	2021
Imprint	CRC Press
Pages	16
eBook ISBN	9781003155089

ABSTRACT

Previous Chapter (chapters/edit/10.1201/9781003155089-6/role-genetically-modified-plants-protection-heavy-metal-toxicity-aaliya-batool-noreen-zahra-rubina-naseer-kanval-shaukat-tahira-rasheed-muhammad-bilal-hafeez?context=ubx)

Next Chapter (chapters/edit/10.1201/9781003155089-8/emerging-roles-osmoprotectants-heavy-metal-stress-tolerance-plants-akbar-hossain-zahoor-ahmad-muhammad-adeel-md-atikur-rahman-md-jahangir-alam-sharif-ahmed-tariq-aftab?context=ubx)

The Hows and Whys of Heavy Metal-Mediated Phytotoxicity: An Insight

| Chapter | First Online: 20 October 2020

| pp 19–41 | Cite this chapter

Cellular and Molecular Phytotoxicity of Heavy Metals

Kalyan Mahapatra, Samrat Banerjee & Sujit Roy

Part of the book series: Nanotechnology in the Life Sciences ((NALIS))

Abstract

For the last few years, heavy metal toxicity in plants has remained as a global concern in respect to environment, agriculture, and ultimately human health. Several anthropogenic activities including modern agriculture process and industrialization cause a sharp increase in the concentration of various heavy metals in air, soil, and water. Constant increase in heavy metal concentration in the environment causes their entry and bioaccumulation in the food chain through plants. In plants, heavy metals directly or indirectly affect a broad range of physiological and metabolic processes including

Zou J, Wang M, Jiang W, Liu D (2006) Chromium accumulation and its effects on other mineral elements in *Amaranthus viridis* L. Acta Biol Cracov Ser Bot 48:7–12

Google Scholar

Acknowledgement

The authors gratefully acknowledge Council of Scientific and Industrial Research, Govt. of India (Ref. No. 38(1417)/16/EMR-II, dated: 17/05/2016 to SR), and SERB, DST, Govt. of India (Ref. No. ECR/2016/000539 to SR), for providing necessary financial supports. KM and SB thank CSIR, Govt. of India, for the JRF fellowship. The authors gratefully acknowledge the contribution of Ms. Sayanti De for preparing the schematic representations of the data.

Author information

Authors and Affiliations

Department of Botany, UGC Center for Advanced Studies, The University of Burdwan, Golapbag Campus, Burdwan, West Bengal, India
Kalyan Mahapatra, Samrat Banerjee & Sujit Roy

Editor information

Editors and Affiliations

Department of Botany and Microbiology, College of Science, King Saud University, Riyadh, Saudi Arabia
Mohammad Faisal

Department of Zoology, College of Science, King Saud University, Riyadh, Saudi Arabia
Quaiser Saquib

Department of Botany and Microbiology, College of Science, King Saud University, Riyadh, Saudi Arabia
Abdulrahman A. Alatar

Department of Zoology, College of Science, King Saud University, Riyadh, Saudi Arabia

Serial No. 77

Abdulaziz A. Al-Khedhairy

Rights and permissions

Reprints and permissions

Copyright information

About this chapter

Cite this chapter

Mahapatra, K., Banerjee, S., Roy, S. (2020). The Hows and Whys of Heavy Metal-Mediated Phytotoxicity: An Insight. In: Faisal, M., Saquib, Q., Alatar, A.A., Al-Khedhairy, A.A. (eds) Cellular and Molecular Phytotoxicity of Heavy Metals. Nanotechnology in the Life Sciences. Springer, Cham. https://doi.org/10.1007/978-3-030-45975-8_2

.RIS .ENW .BIB

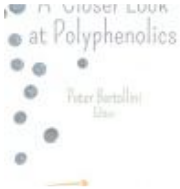
DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-030-45975-8_2	20 October 2020	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-030-45974-1	978-3-030-45975-8	Biomedical and Life Sciences Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

Serial No. 78



A Closer Look at Polyphenolics

$160.00

Peter Bertollini (Editor)

Series: Food Science and Technology
BISAC: TEC012010; TEC012000
DOI: https://doi.org/10.52305/QQNR6474

Polyphenolics are compounds found in plants, such as phenolic acid and flavonoids, that have positive effects on human health and help fight disease. As such, studies of these compounds are valuable for those looking to improve their own health or the health of others. Chapter One addresses the role that polyphenolics plays in the assessment of food integrity and authenticity. Chapter Two studies the potential of regular long-term consumption of various fruit species for reducing diabetes mellitus. Chapter Three provides a platform for the selection of solvent for extraction, column and mobile phase for better separation of polyphenol compounds. Chapter Four presents extraction with subcritical water as a technique for polyphenol isolation. Lastly, Chapter Five attempts to bridge the gap between the different ethnomedical and folklore claims of utilization of Amaranth germplasms against degenerative diseases with matching polyphenol-based chemical data having antioxidant and anti-inflammatory properties.

Serial No. 78

Hardcover Clear

Publication Date: December 28, 2021

Status: Available

Pages: 249

1 Add to cart

Add to Wishlist

ISBN: 978-1-68507-434-0

Categories: **2022**, **Books**, **Chemistry**, **Food Science and Technology**, **Food Science and Technology**, **Nova**, **Science and Technology**

Like 0

Table of Contents **Additional information** **Publish with Us**

Table of Contents

Serial No. 78

Green Technique for Their Extraction from Medicinal Plants
(Aleksandra Cvetanović and LinLin Yan – Faculty of Technology, University of Novi Sad, Novi Sad, Serbia, et al.)

Chapter 5. Polyphenol Based Therapeutic Potential of Amaranths
(Debsmita Sen, Manashi Aditya and Soumen Bhattacharjee – Plant Physiology and Biochemistry Research laboratory, UGC Centre for Advanced Study, Department of Botany, The University of Burdwan, Burdwan, West Bengal, India)

Index

ScienceDirect

Recent Advancement in Microbial Biotechnology

Agricultural and Industrial Approach

2021, Pages 357-385

Chapter 11 - Potential role of heavy metal-resistant plant growth-promoting rhizobacteria in the bioremediation of contaminated fields and enhancement of plant growth essential for sustainable agriculture

Krishnendu Pramanik [a] [b], Tushar Kanti Maiti [b], Narayan Chandra Mandal [a]

https://doi.org/10.1016/B978-0-12-822098-6.00014-8

Abstract

Due to the increased industrialization, use of agrochemicals and various anthropogenic activities, heavy metal contamination is spreading rapidly, which is responsible for serious threats for crop production. In this context, plant growth-promoting rhizobacteria (PGPR)-mediated bioremediation is an ecofriendly, inexpensive, and sustainable approach toward the effective reclamation of metal-contaminated agricultural field. PGPR are naturally dwelling microflora that colonizes around the plant roots to fulfill their nutritional requirement acquired from the root exudates. This consortium results in a mutualistic benefit for both PGPR and plants by an effective plant-microbe interaction.

Three major heavy metals viz., Cd, Cr, Pb, and one metalloid viz., As have been focused on in this chapter revealing their sources, impact on living beings, causes of toxicity, possible remedies, the role of PGPR in the alleviation of metal toxicity and their role in plant growth promotion, and the mechanisms involved to confront such metals.

References (0)

ScienceDirect

Polysaccharide Nanoparticles

Preparation and Biomedical Applications

Micro and Nano Technologies

2022, Pages 455-484

17 - Recent patents and current emergence of polysaccharides- based nanoparticles in medicine and drug delivery

Urmi Halder, Raju Biswas, Ashutosh Kabiraj, Krishnendu Majhi, Moitri Let, Rajib Bandopadhyay

https://doi.org/10.1016/B978-0-12-822351-2.00007-3

Abstract

Natural polysaccharides are ideal for conjugation and chemical modification due to the presence of a diverse type of functional groups like hydroxyl, amino, carboxylate, ester, and sulfate. Moreover, they are hydrophilic, biocompatible, biodegradable, and nontoxic nature. In the race of designing efficient carriers, polysaccharide-based nanoparticles are found to be attractive of being target-specific, pH-responsive, photoresponsive, thermoresponsive. Naturally, multifunctional polysaccharide-based nanoparticles have progressively gained more attention in biomedical applications such as solubilization and controlled release of hydrophobic moieties, receptor-mediated targeting, tissue engineering, gene therapy, and antimicrobial applications. This chapter is compiled with different strategies that are employed to synthesize polysaccharide-based nanoparticles and their recent biomedical applications, especially in medicine and drug delivery systems.

Environment and Green Technology

| Chapter | First Online: 17 May 2022

| pp 111–129 | Cite this chapter

Innovations in Environmental Biotechnology

Moitri Let, Krishnendu Majhi, Ashutosh Kabiraj & Rajib Bandopadhyay

Abstract

Due to the rapid increase in population, the process of industrialization and urbanization are also upsurge in a parallel manner. The nondegradable pollutants generated by anthropogenic activities show a detrimental effect on the biosphere. Various pollutants like heavy metals, oil spills, pesticides, fungicides, solvents, plentiful plastics, and industrial effluents cause several environmental health risks. For healing the environment, a sustainable solution, that is, green technology has come out. Green technology also known as clean technology reduces environmental pollution and conserves natural resources. Nowadays, the technology is very much acceptable for having advantages like zero or low emission of greenhouse gases, conservation of energy and natural resources, minimization of environmental degradation, and better use of renewable resources. There are some trending green technologies, like Bioremediation,

Yan Y, Xu J (2014) Improving winter performance of constructed wetlands for wastewater treatment in northern China: a review. Wetlands 34(2):243–253

Article Google Scholar

Yang W, Li D, Li Z, Zheng X, Hong Y, Jiao Y, Huang L, Gao X, Zhao F, Zhu Z, Liu Y (2019) Comparison of salix genotypes for co-phytofiltration of iron and manganese from simulated contaminated groundwater in a floating culture system. Groundwater Monitor Remed 39(3):71–77

Article CAS Google Scholar

Zdarta J, Meyer AS, Jesionowski T, Pinelo M (2019) Multi-faceted strategy based on enzyme immobilization with reactant adsorption and membrane technology for biocatalytic removal of pollutants: a critical review. Biotechnol Adv 37(7):107401

Article CAS PubMed Google Scholar

Acknowledgement

Authors are thankful to UGC Centre for Advanced Studies, DST-FIST {No. SR/FST/LS-1/2018/188 (C)} and DST PURSE PHASE II, Department of Botany, the University of Burdwan, for pursuing the research work. ML (UGC-Ref. No.: 737/CSIR-UGC NET JUNE 2018) and KM (UGC-Ref. No.: 758/CSIR-UGC NET DEC. 2017) are grateful to UGC-JRF for supporting and providing fund to continue research work. AK is thankful to DHESTBT (WB-DBT) for providing the research fund [Memo no. 30 (Sanc.) BT/ST/P/S&T/2G-48/2017].

Author information

Authors and Affiliations

Department of Botany, UGC-Center for Advanced Study, The University of Burdwan, Bardhaman, West Bengal, India
Moitri Let, Krishnendu Majhi, Ashutosh Kabiraj & Rajib Bandopadhyay

Editor information

Editors and Affiliations

Department of Biotechnology, Dr. B. Lal Institute of Biotechnology, Jaipur, Rajasthan, India
Sudipti Arora

Department of Botany, University of Rajasthan, Jaipur, Rajasthan, India
Ashwani Kumar

Department of Local Resources and Department of Life Sciences, Prefectural University of Hiroshima, Hiroshima, Japan
Shinjiro Ogita

Department of Natural Sciences, Northeastern State University, Broken Arrow, OK, USA
Yuan- Yeu Yau

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Let, M., Majhi, K., Kabiraj, A., Bandopadhyay, R. (2022). Environment and Green Technology. In: Arora, S., Kumar, A., Ogita, S., Yau, Y.Y. (eds) Innovations in Environmental Biotechnology. Springer, Singapore. https://doi.org/10.1007/978-981-16-4445-0_4

.RIS .ENW .BIB

DOI Published Publisher Name

Serial No. 81
https://doi.org/10.1007/978-981-16-4445-0_4
17 May 2022
Springer, Singapore

Print ISBN
978-981-16-4444-3

Online ISBN
978-981-16-4445-0

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

Bioremediation of Heavy Metals by Metagenomic Approaches

| Chapter | First Online: 27 September 2022

| pp 393–413 | Cite this chapter

Omics Insights in Environmental Bioremediation

Dibyendu Khan, Ashutosh Kabiraj, Rajendra Kr Roy, Moitri Let, Krishnendu Majhi & Rajib Bandopadhyay

Abstract

Deposition of heavy metals and other contaminating materials in the environment is a ceaseless and inescapable process. Bioaccumulation of heavy metals is extremely harmful to all domains of life. While dealing with heavy metal pollutions, microbes, especially Proteobacteria and Actinobacteria, acclimatize and adapt themselves to contaminated sites through different metabolic activities. Microbial bioremediation through biosorption, bioaccumulation, solubilization, immobilization, transformation, etc. is an innovative, sustainable, cost-effective, and efficient approach for reducing heavy metal toxicity. Since traditional culturable approaches have limitations, metagenomic

Conflict of Interest: The authors declare that they have no conflict of interest.

Statement on the welfare of animals

No animal was used in this study.

Author information

Authors and Affiliations

UGC Centre for Advanced Study, Department of Botany, The University of Burdwan, Bardhaman, West Bengal, India

Dibyendu Khan, Ashutosh Kabiraj, Rajendra Kr Roy, Moitri Let, Krishnendu Majhi & Rajib Bandopadhyay

Editor information

Editors and Affiliations

Department of Basic and Applied Sciences, School of Engineering and Sciences, G D Goenka University, Gurugram, Haryana, India

Vineet Kumar

Centre of Excellence in Bio-Energy, Amity University Haryana, Gurugram, Haryana, India

Indu Shekhar Thakur

Rights and permissions

Copyright information

About this chapter

Serial No. 82

Cite this chapter

Khan, D., Kabiraj, A., Roy, R.K., Let, M., Majhi, K., Bandopadhyay, R. (2022). Bioremediation of Heavy Metals by Metagenomic Approaches. In: Kumar, V., Thakur, I.S. (eds) Omics Insights in Environmental Bioremediation. Springer, Singapore. https://doi.org/10.1007/978-981-19-4320-1_17

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-981-19-4320-1_17

Published
27 September 2022

Publisher Name
Springer, Singapore

Print ISBN
978-981-19-4319-5

Online ISBN
978-981-19-4320-1

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

ScienceDirect

Advances in Microbe-assisted Phytoremediation of Polluted Sites

2022, Pages 271-300

Chapter 11 - Role of Cd-resistant plant growth-promoting rhizobacteria in plant growth promotion and alleviation of the phytotoxic effects under Cd-stress

Soumik Mitra [a], Krishnendu Pramanik [b], Sayanta Mondal [a], Sudip Kumar Ghosh [a], Antara Ghosh [a], Tushar Kanti Maiti [a]

Show more

https://doi.org/10.1016/B978-0-12-823443-3.00005-3 ↗

Abstract

Cadmium (Cd) toxicity is a potential threat to many organisms including plants, microbes, and human beings. It becomes an elemental part of the food chain from several natural and anthropogenic sources because of its nondegradable and mobile nature. In this context, alleviation of phytotoxic effects under Cd-stress needs to be generated to allow increased plant growth and yield with less or no accumulation of Cd in the edible parts. This agricultural concern can be intensified by using Cd-resistant plant growth-promoting rhizobacteria (PGPR) associated with positively managed plant-based mechanisms including upregulation of antioxidative system, expression, and modulation of Cd-defense related proteins and relevant transporters. Moreover, the microbe-based mechanisms, the PGP traits, also trigger plant productivity. Hence, the main aspect of this chapter is to provide information regarding recent advances in Cd-resistant PGPR in connection with the amelioration of Cd-stress to plants.

ScienceDirect

Unravelling Plant-Microbe Synergy

Developments in Applied Microbiology and Biotechnology

2023, Pages 49-76

Chapter 3 - Multifaceted roles of root exudates in light of plant-microbe interaction

Sayanta Mondal [a], Krishnendu Pramanik [b], Priyanka Pal [a], Soumik Mitra [a], Sudip Kumar Ghosh [a], Tanushree Mondal [a], Tithi Soren [a], Tushar Kanti Maiti [a]

https://doi.org/10.1016/B978-0-323-99896-3.00003-5 ↗

Abstract

Root exudates are high- or low-molecular-weight secondary metabolites of plants secreted as a consequence of root pressure and/or plant-microbe interactions, which have a direct influence on rhizosphere ecology. They are utilized as nutrients by soil microbes. Root exudates are responsible for modifying soil physicochemical properties, manipulating microbial communities in the close vicinity of the rhizosphere, controlling pests, regulating the carbon cycle, and also for the bioremediation of soil contaminants. The chemical composition of root exudates is diverse. In addition, root exudates mediate nodulation, mycorrhizal association, plant growth-promoting rhizobacterial consortia, endophytic associations, antimicrobial activity, biofilm inhibition, quorum-sensing mimicking, and tri-trophic interactions involving nematodes. This chapter will provide useful information on the current advancements in the chemical diversity of root exudate components, the mechanism of exudation, the factors affecting root secretions, several positive and negative interactions in the context of plant-soil-microorganisms, and the role of root exudates in shaping microbial community structure.

Understanding the Crosstalk Between Chromatin Remodeling Mechanism and Phytohormones Signaling for Maintenance of Plant Developmental Plasticity: An Insight

| Chapter | First Online: 19 August 2022

| pp 263–283 | Cite this chapter

Auxins, Cytokinins and Gibberellins Signaling in Plants

Samrat Banerjee, Pinaki Roy & Sujit Roy

Part of the book series: Signaling and Communication in Plants ((SIGCOMM))

Abstract

As inanimate in nature, plants exhibit a high level of developmental plasticity in their growth and development to combat environmental fluctuations. Plants have evolved highly efficient response mechanisms including phytohormones (auxin, cytokinin, gibberellin, abscisic acid, ethylene, brassinosteroids, salicylic acid, jasmonic acid) for

Article CAS PubMed PubMed Central Google Scholar

Acknowledgements

The authors gratefully acknowledge Council of Scientific and Industrial Research, Govt. of India, (Ref. No. 38(1587)/16/EMR-II, dated: 17/05/2016 to SR), UGC, Govt. of India (Start-Up research grant No.F.30-158/2015 (BSR) and DST & BT, Govt. 4 of WB (Ref. No: ST/P/S & T/1G-5/2018 to SR) for providing financial supports performing research related to the topic discussed in this review. SB and PR are thankful to CSIR, Govt. of India, and UGC, Govt. of India for the research fellowship. We apologize to those authors whose work could not be cited due to space limitations.

Author information

Authors and Affiliations

Department of Botany, UGC Centre for Advanced Studies, The University of Burdwan, Golapbag Campus, Burdwan, 713104, West Bengal, India
Samrat Banerjee, Pinaki Roy & Sujit Roy

Corresponding author

Correspondence to Sujit Roy .

Editor information

Editors and Affiliations

Department of Botany, Aligarh Muslim University, Aligarh, India
Tariq Aftab

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Banerjee, S., Roy, P., Roy, S. (2022). Understanding the Crosstalk Between Chromatin Remodeling Mechanism and Phytohormones Signaling for Maintenance of Plant Developmental Plasticity: An Insight. In: Aftab, T. (eds) Auxins, Cytokinins and Gibberellins Signaling in Plants. Signaling and Communication in Plants. Springer, Cham. https://doi.org/10.1007/978-3-031-05427-3_12

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-3-031-05427-3_12

Published
19 August 2022

Publisher Name
Springer, Cham

Print ISBN
978-3-031-05426-6

Online ISBN
978-3-031-05427-3

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

Transcription Factor Mediated Plant Metabolite Production in Response to Environmental Stress Factors: Current Understanding and Future Aspects

| Chapter | First Online: 02 June 2022

| pp 91–122 | Cite this chapter

Metabolic Engineering in Plants

Samrat Banerjee, Pinaki Roy & Sujit Roy

Abstract

The current agriculture is facing a continuous challenge of reaching up to 70% increase in crop productivity by 2050. An alarming expansion of human population, global climate changes, increasing soil salinity, and freshwater scarcity put the sustainable food production in a serious question. The inanimate life of plants makes them surrounded by a myriad of diverse biotic and abiotic stress conditions, which are mostly unavoidable. During the course of evolution, plants have evolved a robust and complicated mechanism of growth and defense trade off when responding to stress conditions. Secondary

SR) for providing financial supports for performing research related to the topic discussed in this review. SB and PR are thankful to CSIR, Govt. of India and UGC, Govt. of India for the research fellowship. We apologize to those authors whose work could not be cited due to space limitation.

Author information

Authors and Affiliations

Department of Botany, UGC Centre for Advanced Studies, The University of Burdwan, Burdwan, West Bengal, India
Samrat Banerjee, Pinaki Roy & Sujit Roy

Editor information

Editors and Affiliations

Department of Botany, Aligarh Muslim University, Aligarh, Uttar Pradesh, India
Tariq Aftab

Department of Biological Sciences, King Abdulaziz University, Faculty of Science, Jeddah, Saudi Arabia
Khalid Rehman Hakeem

Rights and permissions

Copyright information

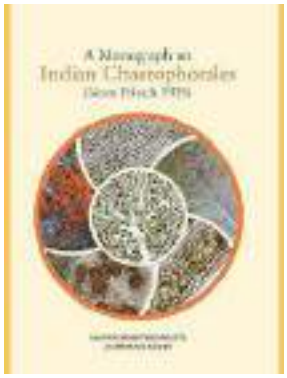
About this chapter

Cite this chapter

Serial No. 86

Banerjee, S., Roy, P., Roy, S. (2022). Transcription Factor Mediated Plant Metabolite Production in Response to Environmental Stress Factors: Current Understanding and Future Aspects. In: Aftab, T., Hakeem, K.R. (eds) Metabolic Engineering in Plants. Springer, Singapore. https://doi.org/10.1007/978-981-16-7262-0_4

Serial No. 87



Roll over image to zoom in

A Monograph on Indian Chaetophorales (Sensu Fritsch 1935)

Hardcover – 1 January 2022

by Amarendra Nath Kargupta (Author), Jai Prakash Keshri (Author)

See all formats and editions

EMI starts at ₹192. No Cost EMI available EMI options

Save Extra with 3 offers

Bank Offer (7): 10% Instant Discount up to INR 1000 on Federal Bank Debit Card Non EMI Trnxs. Minimum purchase value INR

No Cost EMI: Avail No Cost EMI on select cards for orders above ₹3000 | Details

See 1 more

Free Delivery | 7 days Replacement | Secure transaction

The order Chaetophorales (sensu Fritsch) is the most fascinating group of green algae occurring in freshwater, marine, and terrestrial habitats. The presence of heterotrichy is the significant character of this order. The first monograph on Indian Chaetophorales was published by P. N. Saxena in the year 1961. The book covered 34 taxa under 13 genera only, thus there was a need for an updated monograph in this line. The present monograph took almost twenty years in the making as Chaetophorales is a difficult group that needs severe attention and patience to identify even up to a generic level. 127 taxa under 30 genera of Chaetophorales (sensu Fritsch 1935) have been included in this book. A taxonomic key for the genera and infraspecific taxa has been given. Over 557 illustrations under 99 drawings and color plates will help the researchers to identify the taxa. The current systematic trend for the placement of each genus has been analysed in a world

Report an issue with this product

Print length	Language	Publisher
239 pages	English	M/s Bishen Singh Mahendra Pal Singh

Product details

ASIN : B0BB2YRRWC

Publisher : M/s Bishen Singh Mahendra Pal Singh; First Edition (1 January 2022); +91 135 2715748

Language : English

Hardcover : 239 pages

ISBN-10 : 939362819X

ISBN-13 : 978-9393628190

Country of Origin : India

Export to Excel

Serial No. 88

	ISBN	Product Form	Language	Applicant Type	Name of Publishing Agency/Publisher	Nam
on	978-93-95111-05-8	Hardback	English	Publisher	Books Heaven Publications	Editor

Final title verso page not yet uploaded.

Serial No. 88

Proceedings of National Seminar on

Biodiversity: Assessment, Issues, Ethics and Management—Global Scenario

Sponsored by

Department of Science & Technology and Biotechnology (DSTBT), Govt. of West Bengal

11th & 12th July, 2022

Organized by

Department of Botany, Chemistry, Geography and Zoology
East Calcutta Girls' College, Lake Town
Kolkata-700089

In Collaboration with

West Bengal Biodiversity Board
Dept. of Environment, Govt. of West Bengal

Editor in Chief: Dr. Sukla Hazra

Editors: Dr. Amit Choudhury
Dr. Sk. Moquammel Haque
Mrs. Biyas Mukherjee

ISBN: 978-93-95111-05-8

Isolation of endophytic bacterial strain *Bacillus* sp. MCC 4697 from the medicinal plant *Plumbago zeylanica* Linn. and characterization of its plant growth promoting traits.

Sanchali Roy[1], Biyas Mukherjee[1,2], Nasrin Parvin[1], Santanu Tarafdar[1], Sikha Dutta[1*]

[1]Applied and Molecular Mycology and Plant Pathology Laboratory, Department of Botany, The University of Burdwan, Purba Bardhaman, 713104, West Bengal, India.

[2]Department of Botany, East Calcutta Girls' College, P 237, Lake Town Road, Block B, Sreebhumi,Lake Town, Kolkata 700089, West Bengal, India.

Corresponding Email id: sikha.bu.academia@gmail.com

Abstract: Excessive use of chemical fertilizers is a very big problem of today's world because it hampers the environment as well as life. For this, bio fertilizers can help to reduce the hazards. Endophytes are the organisms which can be used as bio fertilizers. Not only endophytic fungi but also endophytic bacteria help in nutrient acquisition, production of various phytohormones and control of phytopathogens. In present study, endophytic bacteria were isolated from *Plumbago zeylanica* Linn. and they were characterized for several tests for plant growth promotion like phosphate solubilization, nitrogen fixation, production of IAA, organic acid, exo-polysaccharide, ammonia, siderophore, HCN etc. These strains also showed salt tolerant capacity. Among all the strains SL2 identified as *Bacillus tequilensis* by 16S rDNA sequence-based homology showed the best result especially for solubilization of phosphate. The cell density of SL2 was checked and phosphate solubilization was checked using different phosphate sources. So, this strain SL2 can be used as biofertilizer and phytostimulator in the agricultural field.

Key words: Endophytic bacteria, *Plumbago zeylanica*, *Bacillus* sp., Plant growth promoting traits, Biofertilizer.

Introduction: *Plumbago zeylanica* Linn. is an ethno medicinally important plant commonly known as 'Chitrak' belongs to the family Plumbaginaceae (Pant *et al*, 2012). This plant has many medicinal properties like anticancer us, antidiarrheal, anti-inflammatory, antimalarial, antibiotic etc. (Kirtikar and Basu, 1975; Modi, 1961; Pillai *et al*., 1981).

Today's world carries a huge population and for that mass production of food is must. Farmers are using number of chemical fertilizer for food production which is not only cost effective but also hampering our environment and lives. Making of cost effective and nonhazardous bioferlizers is a

Export to Excel

Serial No. 89

	ISBN	Product Form	Language	Applicant Type	Name of Publishing Agency/Publisher	Nam
on	978-93-95111-05-8	Hardback	English	Publisher	Books Heaven Publications	Editor

Final title verso page not yet uploaded.

Serial No. 89

Proceedings of National Seminar on

Biodiversity: Assessment, Issues, Ethics and Management—Global Scenario

Sponsored by

Department of Science & Technology and Biotechnology (DSTBT), Govt. of West Bengal

11th & 12th July, 2022

Organized by

Department of Botany, Chemistry, Geography and Zoology
East Calcutta Girls' College, Lake Town
Kolkata-700089

In Collaboration with

West Bengal Biodiversity Board
Dept. of Environment, Govt. of West Bengal

Editor in Chief: Dr. Sukla Hazra

Editors: Dr. Amit Choudhury
Dr. Sk. Moquammel Haque
Mrs. Biyas Mukherjee

ISBN: 978-93-95111-05-8

Investigation on beneficial endophytic fungus *Aspergillus cremeus* MCC 2000 isolated from *Helminthostachys zeylanica* (L). Hook

Santanu Tarafdar[1], Sanchali Roy[1], Biyas Mukherjee[1,2], Nasrin Parvin[1], Sikha Dutta[1,*]

[1]Applied and Molecular Mycology and Plant Pathology Laboratory, Department of Botany, The University of Burdwan, Purba Bardhaman, 713104, West Bengal, India.

[2]Department of Botany, East Calcutta Girls' College, P 237, Lake Town Road, Block B, Sreebhumi,Lake Town, Kolkata 700089, West Bengal, India.

Corresponding email: sikha.bu.academia@gmail.com

Abastract: An endophyte is an endosymbiont, often a bacterium or fungus that lives within a plant for a least part of its life cycle without causing apparent disease. These endophytes enhance host growth, nutrient acquisition and improve the plant's ability to tolerate abiotic stresses, such as drought, salinity and decrease biotic stresses by enhancing plant resistance to insects, pathogens and herbivores. The studies of endophytic fungi and their relationships with host plants will shed light on the ecology and evolution of both the endophytes and their hosts: the evolution of endophyte plant symbiosis; the ecological factors that influence the direction and strength of the endophyte host plant interaction. Our present work was based on *Helminthostachys zeylanica* (L.) Hook, an ethno medicinally important pteridophytes. An endophytic fungus DF1 isolated from root showed various plant growth promoting traits like IAA production, phosphate solubilization, N_2 fixation, EPS production, organic acid production, HCN production, siderophore production etc. Regarding this, the present investigation, our endeavor has impelled us to isolate, characterize and identify the endophytes isolated form root of *Helminthostachys zeylanica* (L.) Hook.

Keywords: Endophytic fungi, *Aspergillus cremeus*, plant growth promotion, biofertilizers.

Introduction:

Now-a-days environmental pollution is the serious problem of today's world which is one of the main causes of decreasing of green plant. Most of the cases, the important pollutants are chemical fertilizer, pesticides, herbicides which is very harmful for all the living organisms including insects, plants, human-being etc. Use of chemical fertilizer gives a negative impact on soil quality by increasing the acid level and make infertile and toxic. These fertilizers lead to eutrophication. Due increasing the uses of chemical fertilizer, it increasing global warming, kill

Export to Excel

Serial No. 90

	ISBN	Product Form	Language	Applicant Type	Name of Publishing Agency/Publisher	Nam
on	978-93-95111-05-8	Hardback	English	Publisher	Books Heaven Publications	Editor

Final title verso page not yet uploaded.

Plant Science Today

Characterization of a potent plant growth promoting fungal strain Aspergillus fumigatus MCC 1721 with special reference to indole-3-acetic acid production

Biyas Mukherjee
Department of Botany, East Calcutta Girls' College, P 237, Lake Town Road, Block B, Sreebhumi, Lake Town, Kolkata 700089, West Bengal, India

Sanchali Roy
Molecular Plant Pathology and Fungal Biotechnology Laboratory, Department of Botany, The University of Burdwan, Purba Bardhaman 713104, West Bengal, India

Nasrin Parvin
Molecular Plant Pathology and Fungal Biotechnology Laboratory, Department of Botany, The University of Burdwan, Purba Bardhaman 713104, West Bengal, India

Santanu Tarafdar
Molecular Plant Pathology and Fungal Biotechnology Laboratory, Department of Botany, The University of Burdwan, Purba Bardhaman 713104, West Bengal, India

Sikha Dutta
Molecular Plant Pathology and Fungal Biotechnology Laboratory, Department of Botany, The University of Burdwan, Purba Bardhaman 713104, West Bengal, India

DOI: https://doi.org/10.14719/pst.1991

Keywords: Aspergillus, IAA producing fungi, indole-3-acetic acid, plant growth promoting fungi

ABSTRACT

In the present study, indole-3-acetic acid (IAA) producing plant growth promoting fungus was isolated from rice field of Purba Bardhaman district, West Bengal, India. Among the isolated 6 strains, AP2 (Aspergillus fumigatus) was selected as best-performing plant growth promoting fungal strain as it was an efficient indole-3-acetic acid producer as well as exhibits different plant growth promoting ability viz, phosphate solubilization, siderophore production, ammonia and hydrogen cyanide production etc. Media and different growth conditions (pH, temperature, concentration of sodium chloride) were optimized for augmentation of the indole-3-acetic acid production. The genus of the selected isolate AP2 was identified as Aspergillus fumigatus both by 18S rDNA sequence-based homology and MALDI-TOF analyses of ribosomal protein. Plant growth promoting ability of Aspergillus fumigatus has been confirmed by measuring different morphological and biochemical growth parameters in Trigonella foenum-graecum L. So, AP2 (Aspergillus fumigatus) can be considered as novel plant growth promoting fungal strain that can be applied as bio-inoculants on agricultural field.

DOWNLOADS

Microbial Genomic Island Discovery: Visualization and Analysis

| Chapter | First Online: 01 April 2023

| pp 63–82 | Cite this chapter

Microbial Genomic Islands in Adaptation and Pathogenicity

Ashutosh Kabiraj, Moitri Let, Krishnendu Majhi, Shrabana Sarkar, Bhramar Dutta, Rajendra Kr Roy, Dibyendu Khan, Raju Biswas, Urmi Halder & Rajib Bandopadhyay

Abstract

Genomic Islands (GIs), the integrative part of the prokaryotic genomes which contain many genes with important biological functions. The islands are one of the main quests of today's concern as they frequently contain genes that are involved in adaptation in diverse environments by providing antimicrobial resistance, virulence, and pathogenicity. The frequency of occurrence of GIs within genome is directly proportional to organism's genomic plasticity and thus the motion of evolution. GIs of prokaryotes can be visualized by using many computational tools. Various databases are spectacularly involved in the analysis of GIs and predictions of their probable functions. Besides pathogenic and

Declaration of Competing Interest

Authors are declaring that they have no conflict of interest.

Funding

No funding has been received for this study.

Author information

Authors and Affiliations

Microbiology Section, UGC-Centre for Advanced studies, Department of Botany, The University of Burdwan, Golapbag, Bardhaman, West Bengal, India
Ashutosh Kabiraj, Moitri Let, Krishnendu Majhi, Shrabana Sarkar, Bhramar Dutta, Rajendra Kr Roy, Dibyendu Khan, Raju Biswas, Urmi Halder & Rajib Bandopadhyay

Centro de Investigación de Estudios Avanzados del Maule, Vicerrectoría de Investigación y Posgrado, Universidad Católica del Maule, Talca, Chile
Shrabana Sarkar

Editor information

Editors and Affiliations

Department of Microbiology, Gargi College, University of Delhi, New Delhi, India
Indra Mani

Department of Biosciences, Indrashil University, Mehsana, Gujarat, India
Vijai Singh

Department of Clinical Laboratories Sciences, College of Applied Medical Sciences, Taif University, Taif, Saudi Arabia
Khalid J. Alzahrani

Center for Biomedicine and Community Health, Vietnam National University, Hanoi, Vietnam
Dinh-Toi Chu

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Kabiraj, A. *et al.* (2023). Microbial Genomic Island Discovery: Visualization and Analysis. In: Mani, I., Singh, V., Alzahrani, K.J., Chu, DT. (eds) Microbial Genomic Islands in Adaptation and Pathogenicity. Springer, Singapore. https://doi.org/10.1007/978-981-19-9342-8_4

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-981-19-9342-8_4

Published
01 April 2023

Publisher Name
Springer, Singapore

Print ISBN
978-981-19-9341-1

Online ISBN
978-981-19-9342-8

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Tinkering with *Stevia rebaudiana* Genome to Improve Its Sweetening Property and Productivity

| Chapter | First Online: 06 January 2024

| pp 373–392 | Cite this chapter

Genetic Engineering of Crop Plants for Food and Health Security

Rinku Mondal, Shreyasi Kundu & Abhijit Bandyopadhyay

Abstract

Stevia rebaudiana has emerged as a globally important crop for its sweetening property imparted by steviol glycosides (SGs)—a class of a unique diterpene glycoside synthesized and localized in their leaves. Among all steviol glycosides, rebaudioside A is the most soughtafter for its flavor, while stevioside is accountable for its bitter aftertaste. Transformation of stevioside into rebaudioside A has been achieved by employing next-generation recombinant technology in *E. coli* and *Saccharomyces cerevisiae* systems by targeting the key gene UGT76G1. Both rebaudioside D and M are evolving as next-generation premium *Stevia* sweeteners because they exhibit low sweetness threshold,

Technology and Biotechnology (WBDST & BT) [206(Sanc.)-ST/P/S&T/1G-17/2018)] for financial support.

The authors acknowledge the Department of Botany, The University of Burdwan, for research and infrastructure facilities.

Author information

Authors and Affiliations

Plant Genetics & Biotechnology Section, Department of Botany, University of Burdwan, Burdwan, West Bengal, India
Rinku Mondal, Shreyasi Kundu & Abhijit Bandyopadhyay

Editor information

Editors and Affiliations

Plant Tissue Culture and Genetic Engineering Lab, National Agri-Food Biotechnology Institute (NABI), Department of Biotechnology, Ministry of Science and Technology (Government of India), Mohali, Punjab, India
Siddharth Tiwari

Department of Biotechnology, School of Bioengineering and Biosciences, Lovely Professional University, Phagwara, Punjab, India
Bhupendra Koul

Rights and permissions

Copyright information

About this chapter

Serial No. 92

Cite this chapter

Mondal, R., Kundu, S., Bandyopadhyay, A. (2023). Tinkering with *Stevia rebaudiana* Genome to Improve Its Sweetening Property and Productivity. In: Tiwari, S., Koul, B. (eds) Genetic Engineering of Crop Plants for Food and Health Security. Springer, Singapore. https://doi.org/10.1007/978-981-99-5034-8_18

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-981-99-5034-8_18

Published
06 January 2024

Publisher Name
Springer, Singapore

Print ISBN
978-981-99-5033-1

Online ISBN
978-981-99-5034-8

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

Development of Cost-Effective High Yielding Cell Disruption Techniques for Microalgae

| Chapter | First Online: 06 July 2024

| pp 107–126 | Cite this chapter

Recent Trends and Developments in Algal Biofuels and Biorefinery

Moumita Chatterjee, Adwaita Das & Abhijit Bandyopadhyay

Part of the book series: Environmental Science and Engineering ((ESE))

Abstract

In general, unit activities for disrupting microbe cells can be subdivided into mechanical and nonmechanical processes. The mechanical methods of high-pressure homogenization (HPH) and bead milling are most commonly used on a broad scale due to their fast processing of cell suspensions, uniform usefulness across algal cell types, and simplicity of scalability. These processes, which have been adapted from equipment used in other sectors to reduce the size of particles or droplets, cause cell disruption by taking advantage of fluid movement, particle–particle contact, and pressure decrease. Examples

Author information

Authors and Affiliations

Sivaram Research Foundation, Bangalore, Karnataka, India
Moumita Chatterjee

Cytogenetics And Molecular Biology Laboratory, Department of Botany, The University of Burdwan, Bardhaman, West Bengal, India
Adwaita Das & Abhijit Bandyopadhyay

Corresponding author

Correspondence to Abhijit Bandyopadhyay .

Editor information

Editors and Affiliations

Department of Biotechnology, Delhi Technological University, Delhi, India
Navneeta Bharadvaja

Department of Biotechnology, Delhi Technological University, Delhi, India
Lakhan Kumar

Department of Life Science, School of Basic Sciences and Research, Sharda University, Greater Noida, India
Soumya Pandit

Department of Biotechnology, School of Life Science and Biotechnology, Adamas University, Kolkata, India
Srijoni Banerjee

Department of Biotechnology, Delhi Technological University, Delhi, India
Raksha Anand

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Chatterjee, M., Das, A., Bandyopadhyay, A. (2024). Development of Cost-Effective High Yielding Cell Disruption Techniques for Microalgae. In: Bharadvaja, N., Kumar, L., Pandit, S., Banerjee, S., Anand, R. (eds) Recent Trends and Developments in Algal Biofuels and Biorefinery . Environmental Science and Engineering. Springer, Cham. https://doi.org/10.1007/978-3-031-52319-9_5

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-031-52319-9_5	06 July 2024	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-031-52318-2	978-3-031-52319-9	Biomedical and Life Sciences Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

ScienceDirect

Plant Transcription Factors

Contribution in Development, Metabolism, and Environmental Stress

2023, Pages 337-367

Chapter 17 - Plant response to heavy metal stress: an insight into the molecular mechanism of transcriptional regulation

Mehali Mitra [1], Puja Agarwal [2], Sujit Roy [1]

Show more

https://doi.org/10.1016/B978-0-323-90613-5.00004-2 ↗

Get rights and content ↗

Abstract

Plant growth and developmental processes have been negatively affected by multifarious environmental stress factors like drought, solar UV radiation, hypothermia, salinity, and rehydration, among which heavy metal contamination of soil and water has become one major threat to crop productivity and quality. Heavy metals are essential for life but only in trace amounts. Excess amounts can cause cellular damage and threaten cellular integrity. In recent times, the situation has been further aggravated with the growing population and increasing demand for food worldwide. Heavy metal toxicity targets crucial molecules in plants and several important pathways in plant cells by inducing oxidative stress by overproduction of reactive oxygen species. Among the many defense responses shown by plants, signaling cascades play a vital role by regulating defense-related genes. Plants counterbalance the overdose of metal by boosting defense responses at the molecular, cellular, and physiological levels by activating complex mechanisms like metal chelation, regulation of metal intake by metal transporters, sequestration of metals into the vacuole, and intensification of antioxidative activities, which might help in stress adaptation without compromising their developmental process and reproductive success. At the molecular level, modulation in the expression of transcription factors (TFs) is also reported following exposure to heavy metals. Several

Multiple Adaptation Strategies of Plants to Mitigate the Phytotoxic Effects of Diverse Pesticides and Herbicides

| Chapter | First Online: 17 February 2023

| pp 309–331 | Cite this chapter

Emerging Contaminants and Plants

Samrat Banerjee, Mehali Mitra, Pinaki Roy, Sreyashi Nandi & Sujit Roy

Part of the book series: Emerging Contaminants and Associated Treatment Technologies ((ECAT))

Abstract

The increase in the world's population in the twentieth century resulted in the subsequent increase in the demand for food. To enhance the constant supply of food for this large population and sustainable crop production, different types of agrochemicals such as fertilizers, pesticides, fungicides, and herbicides were used by farmers for decades. Pesticides are mainly categorized as herbicides, fungicides, and insecticides

Article CAS Google Scholar

Zhang, Q., Liang, M., Liu, Y., Yang, C., Zeng, J., Qin, J., & Liao, Z. (2021). Development of homozygous transgenic Atropa belladonna plants with glyphosate resistance and high-yield scopolamine using metabolic engineering. *Industrial Crops and Products 171*:113953.

Google Scholar

Zhou, Y., Xia, X., Yu, G., Wang, J., Wu, J., Wang, M., Yang, Y., Shi, K., Yu, Y., Chen, Z., Gan, J., & Yu, J. (2015). Brassinosteroids play a critical role in the regulation of pesticide metabolism in crop plants. *Scientific Reports, 5*, 9018.

Article CAS Google Scholar

Acknowledgments

The authors gratefully acknowledge the Council of Scientific and Industrial Research, Govt. of India, (Ref. No. 38(1587)/16/EMR-II, dated: 17/05/2016 to SR), UGC, Govt. of India (Start-Up research grant No.F.30-158/2015 (BSR), and SERB, DST, Govt of India (Ref. No. ECR/2016/000539 to SR) for providing financial support for performing research related to the topic discussed in this review. SB is thankful to CSIR, Govt. of India (09/025(0261)/2018-EMR-I) for the research fellowship. MM (DST/INSPIRE Fellowship/2017/IF17001) and SN (DST/INSPIRE Fellowship/2021/IF200219) are thankful for the DST-INSPIRE fellowship. PR is thankful to UGC (715/(CSIR-UGC NET JUNE 2019)), Govt. of India for the research fellowship. We apologize to those authors whose work could not be cited owing to space limitations.

Author information

Authors and Affiliations

Department of Botany, UGC Centre for Advanced Studies, The University of Burdwan, Golapbag Campus, Burdwan, West Bengal, India

Samrat Banerjee, Mehali Mitra, Pinaki Roy, Sreyashi Nandi & Sujit Roy

Serial No. 95

Editor information

Editors and Affiliations

Department of Botany, Aligarh Muslim University, Aligarh, Uttar Pradesh, India
Tariq Aftab

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Banerjee, S., Mitra, M., Roy, P., Nandi, S., Roy, S. (2023). Multiple Adaptation Strategies of Plants to Mitigate the Phytotoxic Effects of Diverse Pesticides and Herbicides. In: Aftab, T. (eds) Emerging Contaminants and Plants. Emerging Contaminants and Associated Treatment Technologies. Springer, Cham. https://doi.org/10.1007/978-3-031-22269-6_12

.RIS .ENW .BIB

DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-031-22269-6_12	17 February 2023	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-031-22268-9	978-3-031-22269-6	Earth and Environmental Science

Exploring the Critical Function and Molecular Mechanism of WRKY Transcription Factor Family in Regulating Plant Response Under Abiotic Stress Conditions

| Chapter | First Online: 26 October 2023

| pp 121–142 | Cite this chapter

New Frontiers in Plant–Environment Interactions

Samrat Banerjee, Arnab Mukherjee, Mousumi Khatun, Pinaki Roy, Shreyashi Nandi & Sujit Roy

Part of the book series: Environmental Science and Engineering ((ESE))

Abstract

Environmental stresses adversely affect plant growth and development. However, the signaling pathways and metabolic response mechanisms may differ, and most types of abiotic stresses affect the cellular redox homeostasis ultimately affecting the yield

Author information

Authors and Affiliations

Department of Botany, UGC Centre for Advanced Studies, The University of Burdwan, Golapbag Campus, Burdwan, West Bengal, 713104, India

Samrat Banerjee, Arnab Mukherjee, Mousumi Khatun, Pinaki Roy, Shreyashi Nandi & Sujit Roy

Corresponding author

Correspondence to Sujit Roy .

Editor information

Editors and Affiliations

Department of Botany, Aligarh Muslim University, Aligarh, India

Tariq Aftab

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Banerjee, S., Mukherjee, A., Khatun, M., Roy, P., Nandi, S., Roy, S. (2023). Exploring the Critical Function and Molecular Mechanism of WRKY Transcription Factor Family in Regulating Plant Response Under Abiotic Stress Conditions. In: Aftab, T. (eds) New

Serial No. 96

Frontiers in Plant-Environment Interactions. Environmental Science and Engineering. Springer, Cham. https://doi.org/10.1007/978-3-031-43729-8_6

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-3-031-43729-8_6

Published
26 October 2023

Publisher Name
Springer, Cham

Print ISBN
978-3-031-43728-1

Online ISBN
978-3-031-43729-8

eBook Packages
Earth and Environmental Science
Earth and Environmental Science (R0)

Publish with us

Policies and ethics

Understanding the Involvement of Gasotransmitters in the Regulation of Cellular Signalling and Adaptive Responses Against UV-B Mediated Oxidative Stress in Plants

| Chapter | First Online: 26 November 2023

| pp 23–43 | Cite this chapter

Gasotransmitters Signaling in Plants under Challenging Environment

Sayanti De, Mehali Mitra & Sujit Roy

Part of the book series: Plant in Challenging Environments ((PCE,volume 5))

Abstract

Due to their sessile and immobile nature, plants continuously encounter multifarious abiotic stress factors including solar UV-radiation, changing temperature conditions, desiccation, soil salinity, re-hydration, heavy metal toxicity, etc. All these abiotic stress factors severely affect plant growth and development at both vegetative and reproductive

Article CAS Google Scholar

Acknowledgments

The authors gratefully acknowledge Council of Scientific and Industrial Research, Govt. of India, (Ref. No. 38(1417)/16/EMR-II, dated: 17/05/2016 to SR), SERB, DST, Govt. of India (Ref. No. ECR/2016/000539) to SR for providing necessary financial supports. SD is the recipient of fellowship from the SERB, DST, Govt. of India (Ref. No. ECR/2016/000539) funded project. MM is the recipient of Inspire Fellowship from DST, Govt. of India (DST/INSPIRE Fellowship/2017/IF170001).

Author information

Authors and Affiliations

Department of Botany, UGC Centre for Advanced Studies, The University of Burdwan, Golapbag Campus, Burdwan, West Bengal, India
Sayanti De, Mehali Mitra & Sujit Roy

Editor information

Editors and Affiliations

Department of Botany, Aligarh Muslim University, Aligarh, India
Tariq Aftab

CSIC, Estación Experimental del Zaidín, Granada, Spain
Francisco J. Corpas

Rights and permissions

Copyright information

About this chapter

Cite this chapter

De, S., Mitra, M., Roy, S. (2023). Understanding the Involvement of Gasotransmitters in the Regulation of Cellular Signalling and Adaptive Responses Against UV-B Mediated Oxidative Stress in Plants. In: Aftab, T., Corpas, F.J. (eds) Gasotransmitters Signaling in Plants under Challenging Environment. Plant in Challenging Environments, vol 5. Springer, Cham. https://doi.org/10.1007/978-3-031-43029-9_2

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-3-031-43029-9_2

Published
26 November 2023

Publisher Name
Springer, Cham

Print ISBN
978-3-031-43028-2

Online ISBN
978-3-031-43029-9

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

Chapter

Risk and Remediation of Microplastic Pollution in Marine Life

By Rajdeep Shaw (/search?contributorName=Rajdeep Shaw&contributorRole=author&redirectFromPDP=true&context=ubx), Dibyendu Khan (/search?contributorName=Dibyendu Khan&contributorRole=author&redirectFromPDP=true&context=ubx), Madhushree Ghorui (/search?contributorName=Madhushree Ghorui&contributorRole=author&redirectFromPDP=true&context=ubx), MD Nazir (/search?contributorName=MD Nazir&contributorRole=author&redirectFromPDP=true&context=ubx), Punarbasu Chaudhuri (/search?contributorName=Punarbasu Chaudhuri&contributorRole=author&redirectFromPDP=true&context=ubx), Rajib Bandopadhyay (/search?contributorName=Rajib Bandopadhyay&contributorRole=author&redirectFromPDP=true&context=ubx)

Book Remediation of Plastic and Microplastic Waste (https://www.taylorfrancis.com/books/mono/10.1201/9781003449133/remediation-plastic-microplastic-waste?refId=1eaba46d-a157-4250-aa76-1ea022506f51&context=ubx)

Edition	1st Edition
First Published	2024
Imprint	CRC Press
Pages	26
eBook ISBN	9781003449133

Share

ABSTRACT

Previous Chapter (chapters/edit/10.1201/9781003449133-9/scenario-microplastics-waste-ecosystem-sri-bharti-sharma-rachana-kumar-papita-das?context=ubx)
Next Chapter (chapters/edit/10.1201/9781003449133-11/plastic-degradation-using-chemical-solar-biodegradation-poushali-chakraborty-sampad-sarkar-arkaprava-roy-kesang-tamang-papita-das?context=ubx)

Tinkering with *Stevia rebaudiana* Genome to Improve Its Sweetening Property and Productivity

| Chapter | First Online: 06 January 2024
| pp 373–392 | Cite this chapter

Genetic Engineering of Crop Plants for Food and Health Security

Rinku Mondal, Shreyasi Kundu & Abhijit Bandyopadhyay

Abstract

Stevia rebaudiana has emerged as a globally important crop for its sweetening property imparted by steviol glycosides (SGs)—a class of a unique diterpene glycoside synthesized and localized in their leaves. Among all steviol glycosides, rebaudioside A is the most soughtafter for its flavor, while stevioside is accountable for its bitter aftertaste. Transformation of stevioside into rebaudioside A has been achieved by employing next-generation recombinant technology in *E. coli* and *Saccharomyces cerevisiae* systems by targeting the key gene UGT76G1. Both rebaudioside D and M are evolving as next-generation premium *Stevia* sweeteners because they exhibit low sweetness threshold,

Technology and Biotechnology (WBDST & BT) [206(Sanc.)-ST/P/S&T/1G-17/2018)] for financial support.

The authors acknowledge the Department of Botany, The University of Burdwan, for research and infrastructure facilities.

Author information

Authors and Affiliations

Plant Genetics & Biotechnology Section, Department of Botany, University of Burdwan, Burdwan, West Bengal, India
Rinku Mondal, Shreyasi Kundu & Abhijit Bandyopadhyay

Editor information

Editors and Affiliations

Plant Tissue Culture and Genetic Engineering Lab, National Agri-Food Biotechnology Institute (NABI), Department of Biotechnology, Ministry of Science and Technology (Government of India), Mohali, Punjab, India
Siddharth Tiwari

Department of Biotechnology, School of Bioengineering and Biosciences, Lovely Professional University, Phagwara, Punjab, India
Bhupendra Koul

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Mondal, R., Kundu, S., Bandyopadhyay, A. (2023). Tinkering with *Stevia rebaudiana* Genome to Improve Its Sweetening Property and Productivity. In: Tiwari, S., Koul, B. (eds) Genetic Engineering of Crop Plants for Food and Health Security. Springer, Singapore. https://doi.org/10.1007/978-981-99-5034-8_18

.RIS .ENW .BIB

DOI
https://doi.org/10.1007/978-981-99-5034-8_18

Published
06 January 2024

Publisher Name
Springer, Singapore

Print ISBN
978-981-99-5033-1

Online ISBN
978-981-99-5034-8

eBook Packages
Biomedical and Life Sciences
Biomedical and Life Sciences (R0)

Publish with us

Policies and ethics

Solving Bi-Objective Stage Shop Scheduling Problem by Flower Pollination Algorithm with Fuzzy Orientation

Publisher: IEEE

Susmita Bandyopadhyay ; Indraneel Mandal **All Authors**

Abstract:
Stage shop scheduling is a type of scheduling problem in manufacturing in which the operations to be performed on a set of jobs is divided into stages based on the type o... **View more**

Metadata

Abstract:
Stage shop scheduling is a type of scheduling problem in manufacturing in which the operations to be performed on a set of jobs is divided into stages based on the type of operations. The stages are executed sequentially whereas the operations in each stage are executed in no particular order. A bi-objective stage shop scheduling problem has been proposed in this paper. There are two objectives as considered in this paper minimization of makespan and minimization the total completion times of a set of jobs on a manufacturing floor. The paper considers uniform fuzzy processing times for the jobs. The problem is basically solved by Multi-Objective version of Flower Pollination Algorithm (MOFPA). Flower pollination can be either global pollination (biotic pollination) or local pollination (abiotic). This paper applies both the types of pollination based on some probability values. Experimentation shows that MOFPA performs almost to an equivalent extent to the famous Nondominated Sorting Genetic Algorithm – II (NSGA-II). The algorithm has been compared with NSGA-II since NSGA-II is one of the most frequently applied multi-objective methods as evident from the existing literature.

Published in: 2020 International Conference on Inventive Computation Technologies (ICICT)

Date of Conference: 26-28 February 2020

DOI: 10.1109/ICICT48043.2020.9112484

Date Added to IEEE *Xplore*: 09 June 2020

Publisher: IEEE

ISBN Information:

Conference Location: Coimbatore, India

Contents