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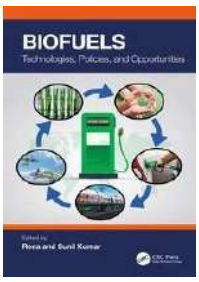

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ABSTRACT

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Serial No. 274

Impacts of Low Carbon Economy in India: A Review

| Chapter | First Online: 27 August 2023

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Economic, Environmental and Health Consequences of Conservation Capital

Tarakeshwar Senapati, Apurba Ratan Ghosh, Krishna Singh & Palas Samanta

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Author information

Authors and Affiliations

Department of Environmental Science, Sidho Kanho Birsha University, Ranchi Road, Purulia, West Bengal, 723104, India
Tarakeshwar Senapati

Department of Environmental Science, The University of Burdwan, Burdwan, West Bengal, 713104, India
Apurba Ratan Ghosh

Department of Economics, University of Gour Banga, Malda, West Bengal, 732101, India
Krishna Singh

Department of Environmental Science, Sukanta Mahavidyalaya, University of North Bengal, Dhupguri, Jalpaiguri, 735210, India
Palas Samanta

Corresponding author

Correspondence to Palas Samanta .

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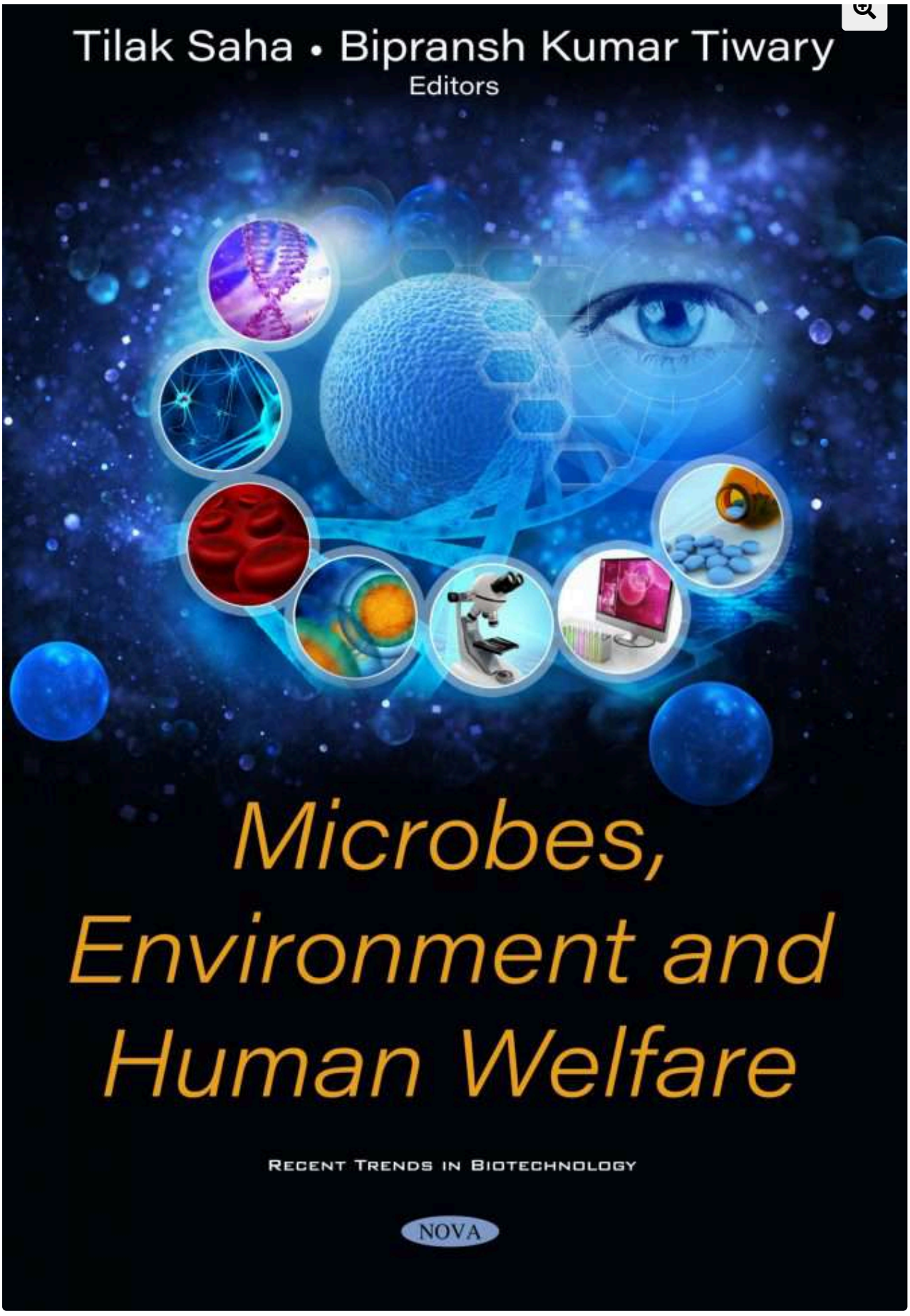
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The book entitled "Microbes, Environment and Human Welfare" is divided into fifteen chapters that cover various aspects of microorganism-based biotechnology, including recent methodologies such as advanced molecular techniques, as well developments in classical microbiological techniques. The authors also explain how the latest and classical techniques are being used in modern-day microbial biotechnology. All chapters were written by experts from prominent universities, research laboratories, and institutes around the globe. Above all, they focus on recent advances in microbial technology that promote the welfare of living beings and the environment.
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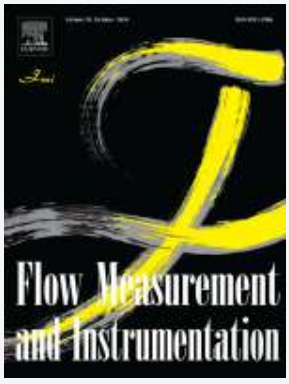

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Author information

Authors and Affiliations

Department of Environmental Science, Sidho Kanho Birsha University, Ranchi Road, Purulia, West Bengal, 723104, India
Tarakeshwar Senapati

Department of Environmental Science, The University of Burdwan, Burdwan, West Bengal, 713104, India
Apurba Ratan Ghosh

Department of Economics, University of Gour Banga, Malda, West Bengal, 732101, India
Krishna Singh

Department of Environmental Science, Sukanta Mahavidyalaya, University of North Bengal, Dhupguri, Jalpaiguri, 735210, India
Palas Samanta

Corresponding author

Correspondence to Palas Samanta .

Editor information

Editors and Affiliations

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Chapter 3

An Overview of Biomass Conversion from Agricultural Waste

Address on Environmental Sustainability

Palas Samanta, Tarakeshwar Senapati, Sukhendu Dey, Apurba Ratan Ghosh

Book Editor(s):Suruchi Singh, Pardeep Singh, Anu Sharma, Moharana Choudhury

First published: 09 December 2022
https://doi.org/10.1002/9781119808428.ch3

Summary

Bioenergy is considered as an integral part to address climatic menace as well as environmental, economic, and social security challenges. Biofuels, in this regard, ensure a sustainable and low-carbon alternative to fossil fuels because of cleanliness and renewable nature. Biofuel production, in particularly, from agricultural residue/waste is very advantageous since agricultural residues are cheap, readily available, renewable in nature, and highly biodegradable. Agricultural wastes become one of the most alternative energy sources for both non-renewable and renewable energy sources recently, since their lignocellulose (lignin, cellulose, hemicelluloses, etc.) content proved as promising substrate for biofuel production. Apart from these, the economic aspect (lower production cost due to cheaply available materials) and environmental concern (environmental deterioration due to phenolic compounds) of agricultural waste can be minimized through its utilization during biofuel production. Accordingly, this review paper focuses on various aspects of biofuel production such as agricultural waste types, their sources, and different economic conversion technologies for biofuel production. In particular, thermochemical techniques (pyrolysis, liquefaction, and gasification) and biochemical technologies (anaerobic digestion, photobiological hydrogen production, and alcoholic fermentation) were critically evaluated. Additionally, the role of different regulatory factors, namely pH, temperature, pressure, amount of biomass, and microbial actors, are discussed. Finally, the outcomes of this review paper will provide clear picture about various aspects of agricultural waste-based biofuel production in economical and environmentally beneficial way and will provide valuable information to researchers and scientific community.

Serial No. 279

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Mechanism of metal sorption by biochar

From the book BioChar

Palas Samanta, Sukhendu Dey, Jinho Jung and Apurba Ratan Ghosh

https://doi.org/10.1515/9783110734003-006

Abstract

Biochar has received potential interest as a cost-efficient and environmentfriendly sorbent material to remediate metal contamination recently. However, the mechanism of metal sorption capacity by agriculture-based biochar is still lacking. Accordingly, this review chapter demonstrates metal sorption mechanisms by biochar including physical binding, ion exchange, membrane filtration, complexation, precipitation, sorption, and electrostatic interactions and elucidate the role of corresponding biochar characteristics namely biochar preparation methods, surface area or charge, porosity, medium pH, presence of functional groups, mineral components, and pyrolysis temperature. Additionally, this review chapter addresses different techniques, namely steam or acid/base activation, composite impregnation with carbonrich materials, minerals, organic compounds, and so on to improve metal sorption capacity either through functional improvement or providing efficient surface attributes to biochar. Furthermore, this chapter describes different mathematical models to check the metal sorption efficiency by biochar. Finally, this chapter highlights the future prospects of biochar-associated metal sorption in large-scale field application cost-effectively.

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ASSESSMENT OF WATER QUALITY PARAMETERS OF AN ABANDONED OPENCAST COAL PIT (OCP) OF ASANSOL-RANIGANJ COALFIELD (ARCF), PASCHIM BARDHAMAN, WEST BENGAL, INDIA

Amit Kumar Dey
Ecotoxicology Laboratory, Department of Environmental Science,The University of Burdwan, Purba Bardhaman, West Bengal, India

Apurba Ratan Ghosh
Ecotoxicology Laboratory, Department of Environmental Science,The University of Burdwan, Purba Bardhaman, West Bengal, India

DOI: https://doi.org/10.53808/KUS.SI.2023.ICES.A55-ls

Keywords: Samdihi OCP, water quality, aquaculture, agriculture, pisciculture

Abstract

Coal mining and its auxiliary actions have already been proved to cause potential pollutions to ecosystems. This research work assesses the surface water quality of Samdihi abandoned Opencast Coal Pit (OCP) of Asansol-Raniganj Coalfield Areas (ARCF). Twenty seven water samples were collected maintaining temporal variability and were analyzed for physicochemical attributes. The pH was slightly alkaline with lowest of 7.8 during winter. The water temperature varied between 20 and 35°C. Conductivity was highest during winter (601±3.51 µS/cm) and lowest during monsoon (333±2.8 µS/cm). The Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) ranged from 212 to 2738 mg/L and 170 to 413 mg/L respectively. The low values of TSS (212 mg/L) and TDS (170 mg/L) were observed during winter and the higher values of TSS (2738 mg/L) and TDS (413 mg/L) were observed during monsoon. The dissolved oxygen concentration was moderately high (between 6.89 and 8.43 mg/L) but comparatively higher (8.5 mg/L) in monsoon. The estimated dissolved concentration of phosphate, sulphate, sodium and potassium were 4.2±0.17, 98.6±10.48, 8.6±0.47 and 2.5±0.75 mg/L respectively. Zooplankton population in the OCP was found to be 8±1.76

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Life Science

EXPOSURE UNDER CHOLINE CHLORIDE EXHIBITS SUCCESSFUL GONADAL MATURATION OF INDIAN MAJOR CARPS AND AIR-BREATHING TELEOSTS IN A SEMI-INTENSIVE PISCICULTURE SYSTEM: A HISTOTECHNOLOGICAL INTROSPECTION

Subhas Das
Ecotoxicology Laboratory, Department of Environmental Science, The University of Burdwan, Burdwan, West Bengal, India

Kishore Dhara
Freshwater Fisheries Research and Training Centre, Directorate of Fisheries, Govt. of West Bengal, Kulia, Kalyani, Nadia, West Bengal, India

Nimai Chandra Saha
Nimai Chandra Saha, Department of Zoology, The University of Burdwan, Burdwan, West Bengal, India

Apurba Ratan Ghosh
Department of Environmental Science, The University of Burdwan, Burdwan 713 104, West Bengal, India

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Keywords: Indian major carps, air-breathing teleosts, semi-intensive culture, choline chloride, ovary, testis

Abstract

Surveillance under direct field-pond application of choline chloride in addition to farm-made-aqua-feed under semi-intensive culture system was investigated on the gonadal maturity in two Indian Major Carps *Catla catla* (Catla) and *Labeo rohita* (Rahu) and in two air-breathing teleosts, e.g., *Clarias batrachus* (Magur) and *Anabas testudineus* (Koi) reared in a ratio of 2:5:1:1:: Catla:Rahu:Magur:Koi for a period of 90-d both during dry [November to January as control-dry (CD) and treatment-dry (TD)] and in breeding seasons [June to August as control-breeding (CB) and treatment-breeding (TB)]. Results were compared with control [C: pond (C) fed only with farm-made-aqua-feed] and

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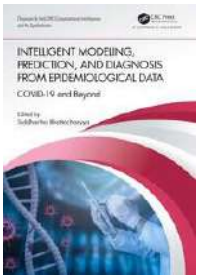

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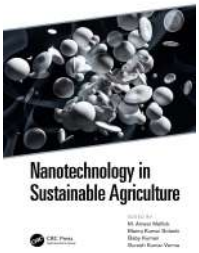

Nanomaterials, an Eco-Friendly Replacement of Traditional Agricultural Plant Fungicides

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Chapter 1 - Multidimensional controlling properties of biofabricated silver-nanoparticles on different mosquito species

Arghadip Mondal, Priyanka Debnath, Naba kumar Mondal

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Abstract

Nanoparticles are playing an important role in controlling mosquitoes, and have done so for the last 10years. Now, this technology is applied in many fields for their very high affectivity compared to bulk particles because of their size, which is between 100nm. Mosquitoes have spread various deadly diseases like yellow fever, zika, dengue, West Nile, and filaria. But commercially available chemical, physical, and biological products or techniques cannot control this vectors at a satisfactory level. From this background, nanotechnology is one of the main attractions of world researchers. Specially silver nanoparticles activity was better as a mosquito-larvicidal agent compare to other biosynthesized nanoparticles. The effect of silver nanoparticles was different on various stage of mosquito life cycle.

In this chapter, we will focus on the synthesis properties of silver nanoparticles from different biological sources, like microbes, plants, and animal. We will also focus on controlling properties of silver nanoparticles on different mosquito species and different stages of their life cycle. Finally, this chapter concluded a comparative study of AgNPs

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Cognitive Data Science in Sustainable Computing

2022, Pages 163-180

Chapter 7 - ZnO nanoparticles: a facile synthesized agent for removing dye from aqueous solution in an ecofriendly way

Priyanka Debnath, Arghadip Mondal, Naba Kumar Mondal

https://doi.org/10.1016/B978-0-12-824038-0.00007-9 ↗

Abstract

Colored waters is an emerging issue, especially the wastewaters discharging from dyeing industries, ultimately affecting the drinking water. To minimize the detrimental effects of contaminated water and to overcome the inadequacy of traditional methods, technology-based smart treatment processes are imperative for sustainable supply of drinking water. Nanoparticle is a very promising class of materials used for this purpose which can effectively act as a potential adsorbent materials for dye-adsorption as well as photocatalyst. In this chapter, a brief description of nanostructured ZnO along with its different synthesis methods and its remarkable efficiency toward removal of some widely used azo and nonazo dyes from aqueous system will be discussed.

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Chapter 8 - Optimization of rural indoor kitchen structure and minimizing the pollution load: a sustainable environmental modeling approach

Deep Chakraborty, Naba Kumar Mondal

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Abstract

Studies showed good ventilation is one of the key factors that can play an important role to minimize the health risk from indoor air pollution. In the present study, toxic indoor air pollutants (CO, CO_2, and O_3) were selected as one of the key response variables and the windows number, the kitchen volume, and cooking hour were selected as the factors to optimize the rural kitchen configuration. Optimization was executed in the design expert software while implementing response surface methodology (RSM). From the ANOVA analysis, it was clear that all models applied were significant. Moreover, there were high desirability values in case of CO, CO_2, temperature, and relative humidity provided that the optimum conditions/configurations were applied. This work describes how rural villagers can optimize their kitchens with their low-cost materials to build a sustainable indoor household condition, which will provide a sustainable healthy lifestyle.

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Edited by:
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Editors

Siddhartha Bhattacharyya

Rajnagar Mahavidyalaya, Birbhum, India

Naba Kumar Mondal

Environmental Chemistry Laboratory, Department of Environmental Science, The University of Burdwan, Bardhaman, West Bengal, India

Koushik Mondal

Computer Centre, IIT (ISM) Dhanbad, Dhanbad, Jharkhand, India

Jyoti Prakash Singh

Department of Computer Science and Engineering, National Institute of Technology Patna, Patna, Bihar, India

Kolla Bhanu Prakash

Department of Computer Science Engineering, K L Deemed to be University, Green Fields, Vaddeswaram, Guntur District, A.P., India

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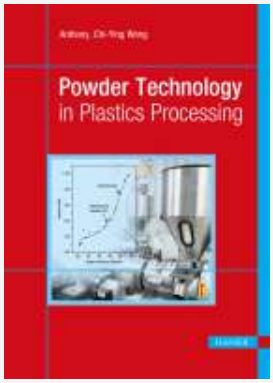

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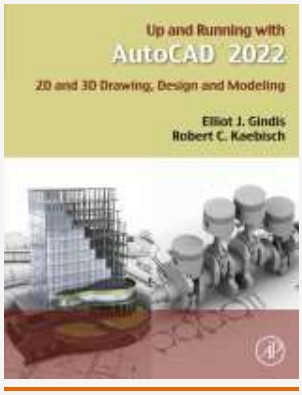

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3 - Nanoparticles: A new tool for control of mosquito larvae

Arghadip Mondal, Priyanka Debnath, Naba Kumar Mondal

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Abstract

Nanoscience is an interdisciplinary subject that has been one of the most dynamic disciplines in material science. Key features of nanoparticles are clusters of atoms in a size range within 1–100nm. Metal nanoparticles can be synthesized by physical, chemical, and biological routes. But the green or biological route for nanoparticle synthesis from a biological origin is of more interest than other ways, due to its environment friendliness, economically cheap, feasibility, and applications in various field. Several analytical tools were used for structure determination and characterization of synthesized nanoparticles.

At present, nanotechnology has been applied in various fields, but this chapter focuses on the power of biomolecules for the synthesis of silver, gold, zinc, and copper nanoparticles, and their effect on mosquito larvicidal mortality. Recently mosquitoes spired many pestilence diseases worldwide, as well as they act as vectors for devastating parasites, including yellow fever Zika, dengue, West Nile, and others. In this chapter, we studied many previous research articles about the activity of these four nanoparticles to determine suitable nanoparticles based on larvicidal activity through statistical data. In addition, we also studied environment toxicity of these four nanoparticles.

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Editors

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The University of Burdwan, Burdwan, India

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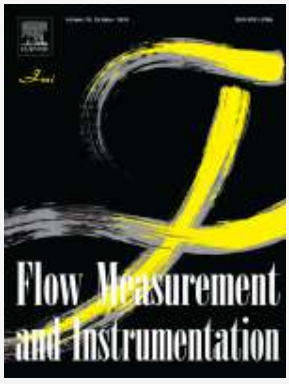

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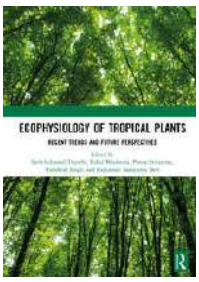

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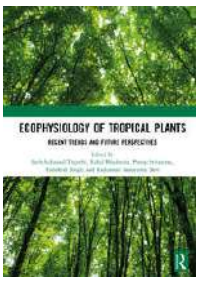

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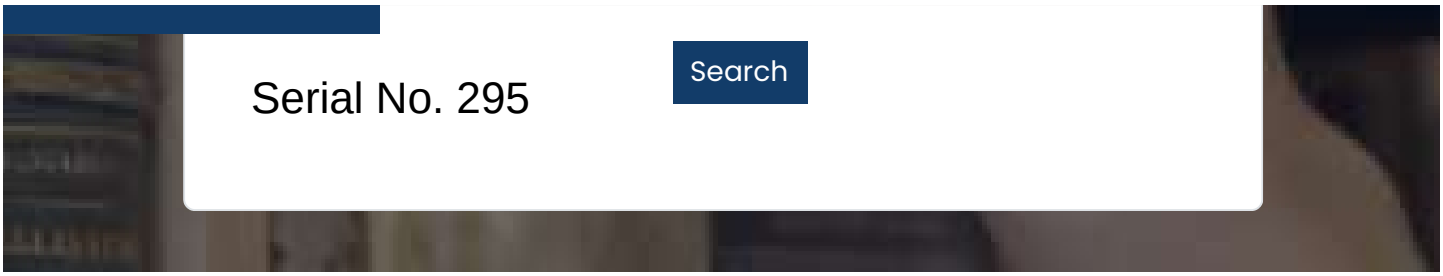

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