
Biotechnology for Biofuels: A Sustainable Green Energy Solution

Nitish Kumar
Editor

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 Springer

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Preface

The depletion of petroleum-derived fuel and environmental concerns have prompted many millennials to consider biofuels as alternative fuel sources. But completely replacing petroleum-derived fuels with biofuels is currently impossible in terms of production capacity and engine compatibility. Nevertheless, the marginal replacement of diesel with biofuel could delay the depletion of petroleum resources and abate the radical climate change caused by automotive pollutants. Energy security and climate change are the two major driving forces for worldwide biofuel development and also have the potential to stimulate the agro-industry. The development of biofuels as alternative and renewable sources of energy has become critical in national efforts towards maximum self-reliance, the cornerstone of our energy security strategy. At the same time, the production of biofuels from various types of biomass such as plants, microbes, algae, and fungi is now an ecologically viable and sustainable option. This book describes the biotechnological advances in biofuel production from various sources while also providing essential information on the genetic improvement of biofuel sources at both the conventional and genomic level. These innovations and the corresponding methodologies are explained in detail.

Biotechnology for Biofuels: A Sustainable Green Energy Solution contains 11 chapters which covers the latest developments in the research on a promising biofuel crop *Jatropha*, discusses the application of nanotechnology and computational biology in biofuel production, addresses the role of microorganisms in biofuel production, catalytic approach for production of hydrocarbon-rich bio-oil from a red seaweed species, seaweed biomass and microbial lipids as a source of biofuel, and biomass of bamboo and sugarcane as a source of bioenergy.

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Nitish Kumar

Contents

1	Biofuels: Perspective for Sustainable Development and Climate Change Mitigation	1
	Akshay Singhal and Prashant	
2	Nanoparticles for Sustainable Bioenergy and Biofuel Production . . .	23
	Muhammed Aasim, Egemen Foto, and Muhammad Sameeullah	
3	Bio-Hydrogen: Technology Developments in Microbial Fuel Cells and Their Future Prospects	61
	Pamidimarri D. V. N. Sudheer, Sushma Chauhan, and Balasubramanian Velramar	
4	Recent Advances in Genetic Improvement of <i>Jatropha curcas</i>: A Potent Biodiesel Plant	95
	Nitish Kumar and Swati Kamari	
5	Catalytic Approach for Production of Hydrocarbon Rich Bio-Oil from a Red Seaweed Species	109
	Sanjay Kumar, Priyanka Roat, Sonal Hada, Bhawna Chechani, Neetu Kumari, Praveen Ghodke, and Devendra S. Rawat	
6	Seaweed Biomass and Microbial Lipids as a Source of Biofuel	135
	Surabhi Agrawal, Kusum Khatri, and Mangal S. Rathore	
7	Microbial Biofuels: An Economic and Eco-Friendly Approach	165
	Azmi Khan, Pratika Singh, and Amrita Srivastava	
8	Biofuels: Sources, Modern Technology Developments and Views on Bioenergy Management	197
	Sushma Chauhan, Balasubramanian Velramar, Rakesh Kumar Soni, Mohit Mishra, and Pamidimarri D. V. N. Sudheer	
9	Integrating Omics and Microbial Biotechnology for the Production of Biofuel	221
	Nikhil Kirtipal and Asheesh Shanker	

-
- 10 An Overview on Biomass of Bamboo as a Source of Bioenergy 241**
Sonal Hada, Priyanka Roat, Bhawna Chechani, Sanjay Kumar,
Dinesh Kumar Yadav, and Neetu Kumari
- 11 Advances and Challenges in Sugarcane Biofuel Development 267**
Abhay Kumar, Vivekanand Tiwari, Pratibha Singh,
Sujit Kumar Bishi, Chandan Kumar Gupta, and Gyan Prakash Mishra

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65

An Overview on Biomass of Bamboo as a Source of Bioenergy

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Sonal Hada, Priyanka Roat, Bhawna Chechani, Sanjay Kumar, Dinesh Kumar Yadav, and Neetu Kumari

Abstract

Biomass and derived biofuels are the main sustainable and renewable sources of energy. Traditionally it is used as energy required source in developing countries from ancient period for their domestic needs. Biomass is easily available across the world and a cheaper source of energy, as well as combustion of biomass produces less quantity of greenhouse gases. This chapter documents different aspects of biomass, lignocellulosic conversion methods of bamboo biomass to fuel, namely different thermochemical routes (combustion, gasification, pyrolysis, and liquefaction) and biochemical route. Bamboo is a faster growing plant, which could be one of the useful sources of energy. The considerable downside of bamboo cultivation is vegetative propagation and major land requirement are some challenges to be resolved and further research is needed to fulfill the need of our increasing demand for energy.

Keywords

Bamboo · Biomass · Renewable energy · Bio-fuel · Thermochemical conversion · Biochemical conversion

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241