Preface

Rampant industrialization in the developing world is causing more and more nuisance by way of increasing global ecological devastation, and the irony is that there are not enough resources to bring the whole world up to the industrial level of the developed world. While we are increasingly becoming aware of climate change issues and the underlying causes, it is a blessing that nature has given the earth a vast variety of microorganisms which are capable of treating a variety of anthropogenic toxic chemicals, mining and industrial wastes, and other pollutants. These microscopic living beings can be deployed as such or genetically engineered for the cleaning of all the mess that man has created in the name of industrialization. The biodiversity of microorganisms is quite striking. Taking cue from the microbial metabolism, we must devise methods to clean our environment. Thanks to modern science as it evolves, we now have detailed genetic maps of hundreds of microbes that have spawned an explosion of new technologies. Looking ahead to the future, microbes will continue to dominate several areas of science and engineering and in particular it can be brought to bear on pollutants for a cleaner environment.

Understanding the biochemistry inherent to microbial biodiversity, and availability of techniques related to applied microbiology, is needed to provide a strong alternative to the conventional methodologies currently being adopted to solve environmental issues. The book "Environmental Microbial Biotechnology" explores and emphasizes on several aspects of microbial technologies to provide adequate information to researchers and industrialists to help resolve some of the major environmental issues.

The book provides updated information on applied microbiology and biochemistry of polluted ecosystem and strategies for environmental reclamation by use of bacteria, fungi, and algae. Some chapters give a detailed review on the microbial diversity and development of technology related to environmental sustainability. The book also gives detailed information on role of microorganisms in waste management, bioremediation, bioleaching, bio-hydrometallurgy, metal–microbe interaction for Fe and Mn phase transformation, biosensors, etc., related to ecological conservation. Few chapters discuss on valorization of different types of specific

wastes, such as organic saline waste/wastewater, mining soil and mine area, and agriculture wastes, and the use of cotton gin waste for ethanol production for value addition and waste valorization. Microalgal technology for green fuel generation is also discussed with great hope and challenges.

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