



## Plastic degradation and utilization by microbes

Sikandar I. Mulla Editors

ISSN 2512-1901

ISSN 2512-1898 (electronic)

Microorganisms for Sustainability

ISBN 978-981-16-4573-0

ISBN 978-981-16-4574-7 (eBook)

<https://doi.org/10.1007/978-981-16-4574-7>

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<b>9</b>	<b>Plastic Degradation and Utilization by Microbes: Challenges and Scope</b> . . . . .	<b>177</b>
	Amit Kumar Verma, Ashok Kumar Nadda, Arun Gupta, and Swati Sharma	
<b>10</b>	<b>Marine Microorganisms: From Pollutant Degradation to Added Value Products</b> . . . . .	<b>193</b>
	Fuad Ameen, Mona S. Al Tami, Khawla Alsamhary, and Peijun Zuo	
<b>11</b>	<b>Biodegradation of Pesticides Used in Agriculture by Soil Microorganisms</b> . . . . .	<b>213</b>
	Namadev K. Pujar, H. G. Premakshi, Madhu P. Ganeshkar, and Chandrappa M. Kamanavalli	
<b>12</b>	<b>Probiotic Enzymes in Biodegradation and Value-Added Products</b> . . . . .	<b>237</b>
	Prakash Kenchappa Karegoudru, Rangaswamy Bidarekere Eshwarappa, and Gurumurthy Dummi Mahadevan	
<b>13</b>	<b>Current State, Challenges, and Perspectives on Microbial Degradation of Dioxin and Furan</b> . . . . .	<b>247</b>
	S. Prajwal and Satish Kumar Murari	
<b>14</b>	<b>The Management of Crude Oil Spill by Bioremediation Technique</b> . . . . .	<b>269</b>
	Muazzam Sheriff Maqbul, Aejaz A. Khan, S. M. Shakeel Iqbal, Sikandar I. Mulla, Gouse Basha Sheik, and Ali Mohamed Alshabi	
<b>15</b>	<b>Bacterial Pigments: An Untapped Colorful Microbial World</b> . . . . .	<b>285</b>
	Geetanjali R. Kamble, Gurusiddhesh B. Hiremath, Shivprasad V. Hiremath, and Murigendra B. Hiremath	
<b>16</b>	<b>Bioinoculants for Rapid Production of Vermicompost</b> . . . . .	<b>309</b>
	Veeresh Santhebennur Jayappa, Keerthi Shivanand, and Paramesha Mahadevappa	
<b>17</b>	<b>Microbial-Mediated Mechanism to Improve Rock Phosphate Solubilization and Its Agronomic Implications</b> . . . . .	<b>327</b>
	Rojali Maharana, B. S. Manisha Singh, Kalicharan Mandal, and Nabin Kumar Dhal	

# Plastic degradation and utilization by microbes: Challenges and scope

Amit Kumar Verma <sup>a</sup>, Ashok Kumar Nadda <sup>b</sup>, Arun Gupta <sup>c</sup>, Swati Sharma <sup>c</sup>

<sup>a</sup> University Institute of Biotechnology, Chandigarh University, Mohali, Punjab, India

<sup>b</sup> Department of Biotechnology and Bioinformatics, Jaypee University of Information Technology, Waknaghat, Solan, India

<sup>c</sup> Faculty of Chemical Engineering and Natural Resources, Universiti Malaysia Pahang, Lebuhraya Tun Razak, Kuantan, Pahang Darul Makmur, Malaysia

## ABSTRACT

After the discovery of plastics in 1950, it has been used expeditiously throughout the world, which leads to its overaccumulation in the ecosystem. Microplastics are widely affecting the life of terrestrials and marine ecosystems. Natural depolymerization of plastics is very slow and progression takes a long time. Physical and chemical methods are quite worthwhile, but the biological plastics degradation has gained an interest in recent decades. In the biological degradation of plastics, the microorganisms attach to the surface of the plastics and the enzymes convert long chain of polymers into non- or less toxic forms. This review summarizes progressive data on microorganisms degrading plastics, physical and chemical methods, mechanisms for biofilm formation onto plastic materials, enhancement of microbial depolymerization by enzymatic catalysis, the engineering of enzymes, pathways modification, and microbiome's role in plastic depolymerization.

## KEYWORD

Microbial depolymerization; Biofilms; Biodegradation; Depolymerases; Free radicals