

1. Record Nr.	UNINA9911020177203321
Autore	Vinayak Vandana
Titolo	Diatom Cultivation for Biofuel, Food and High-Value Products
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2025 ©2025
ISBN	9781394174980 1394174985 9781394174966 1394174969 9781394174973 1394174977
Edizione	[1st ed.]
Descrizione fisica	1 online resource (441 pages)
Collana	Diatoms: Biology and Applications Series
Altri autori (Persone)	GordonRichard
Disciplina	579.85
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	<p>This unique book examines the techno-economic prospects of diatom cultivation, the design and implementation of algal reactors, and the potential of diatoms as a source of biofuel and other value-added products. Diatom Cultivation for Biofuel, Food and High-Value Products covers the scientific, economic, and practical aspects of using diatoms for multiple purposes. It explores an integrated approach to diatom cultivation, including discussions on techniques, harvesting methods, and innovative technologies. The book discusses the potential of these techniques for improving the efficiency and yield of diatom-based biofuels, as well as the challenges and ethical considerations associated with genetic engineering. Readers of the book will discover a wealth of information including: The adaptation of chitosan-based harvesting methods for microalgae flocculation; the trends, scope, and techno-economic prospects of diatom cultivation, including the design and implementation of algal reactors and the potential of diatoms as a source of biofuel and other value-added products. Advanced</p>

applications and innovative techniques in the field of diatoms and microalgae such as an in-depth analysis of the pigments and proteins found in *Phaeodactylum tricornutum*; the nature and applications of diatom cell walls, including their purification processes and industrial uses; the biochemical engineering of diatoms for health and biorefinery concepts, highlighting the potential of diatoms in producing biofuels and other high-value products; the metabolic and transcriptomic stress and engineering of diatoms to enhance lipid production, exploring the stress conditions that can increase oil yield; explores the genetic engineering techniques, such as CRISPRCas9 and RNA interference. The environmental and industrial applications of diatoms for low-value products, such as diatom as a prospective green anode material; diatom cell disruption and milking via a nano biorefinery for biofuel production, utilizing techniques like pulsed electric fields, high-pressure homogenization, ultrasonication, etc; genetic engineering and metabolic engineering in diatoms for oil production; the use of diatoms for heavy metal bioremediation, exploring the mechanisms of heavy metal uptake by diatoms, including biosorption and bioaccumulation; the transesterification of diatom oil and parameters for optimization; diatom harvesting for lipid production like bubble wrap (Bubble Farming). Audience The book serves as a guide for researchers and scientists in phycology, biology, ecology, environmental science, biofuels, bioengineering as well as nutritionists and dieticians who design functional foods and nutraceutical products.

---