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First Edition

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PREFACE

Deliberately breaking with the classical biology-centered description of marine organisms and their products, this reference emphasizes microbial technology over basic biology, setting it apart from its predecessors. As such, it systematically covers the technology behind high-value compounds for use as pharmaceuticals, nutraceuticals or cosmetics, from prospecting to production issues.

Following a definition of the field, the book goes on to address all industrially important aspects of marine microbial biotechnology. The first main part contains a description of the major production organisms, from archaeobacteria to cyanobacteria to algae and symbionts, including their genetic engineering. The remaining four parts look at commercially important compounds produced by these microorganisms together with their applications. Throughout, the emphasis is on technological considerations, and the future potential of these organisms or compound classes is discussed. A valuable and forward-looking resource for innovative biotechnologists in industry as well as in academia.

We are very much thankful to Thanuj International Publishers who readily accept and publish this subject.

Mrs. LAVANYA G
Ms. ISHWARYA J
Ms. INDUMATHI M

MARINE MICROBIOLOGY

Unit I: Marine Microbial Habitats: Marine environment– shallow and deep sea, coastal, mangroves and coral environments - properties of seawater , chemical and physical factors of marine environment; Diversity of microorganisms in marine environment - Archaea, bacteria, actinobacteria, cyanobacteria, algae, fungi, viruses and protozoa.

Unit II: Marine Extremophiles :Marine extremophiles - Survival at extreme environments – starvation – adaptive mechanisms in thermophilic, alkalophilic, osmophilic and barophilic, psychrophilic microorganisms – hyperthermophiles, halophiles and their importance; Significance of marine microflora - Microbial endosymbionts – epiphytes, coral-microbial association, sponge-microbial association.

Unit III: Cultivation of Marine Microbes and Nutrient cycling :Methods of studying marine microorganisms - sample collection, isolation and identification; Preservation methods of marine microbes; Nutrient cycling in Marine Environment - Role of microorganisms in carbon, nitrogen, phosphorous and sulphur cycles in the marine environment.

Unit IV: Marine Pollution and Bioremediation :Pollution in marine environment; Pathogenic microorganisms, distribution, indicator organisms, prevention and control of water pollution, quality standards; Xenobiotics, heavy metals and crude oil; Native microbial consortia and Genetically Engineered Microbes in bioremediation of polluted marine sites - Biofouling – Causes and their control.

Unit V: Microbial Products from Sea :Production and applications of marine microbial products – Carrageenan, agar-agar, sea weed fertilizers, carotene, enzyme, antibiotics, antitumour agents, biosurfactants and pigments; Preservation methods of sea foods; Quality control and regulations for microbial quality of fishes, shellfish and Marine living resources used for food.