

Thermophilic Microorganisms

Edited by

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Preface

Thermophiles thrive in various environments in both marine and terrestrial habitats. The ability of microorganisms to proliferate under extreme conditions is of widespread importance in microbial physiology, biological evolution, the ecological cycle and industry biotechnology. The discovery of thermophilic microorganisms and their enzyme systems has created new opportunities for various industrial applications over the past decades. Temperature is one of the most important factors controlling the adaptation and evolution of organisms, and high-temperature environments are of special interest for scientists, as they reveal the extremes to which evolution has been pushed.

In this book, leading scientists in this field highlight the current achievements of the most updated topic areas. The diversity and ecological roles of thermophiles, biochemical properties of

thermostable biocatalysts and their application, the role of polyamines and viruses in thermophiles, DNA replication and metabolic engineering of thermophiles are all covered. Extensive focus is given to industrial applications of thermostable catalysts including alcohol dehydrogenase, glycoside hydrolase, protease and lipases. In addition, authors discussed technical challenges and future development trends.

International experts in this field from Canada, China, Germany, Japan and the USA collaborated on this book. Thank you for all your valuable contribution. In addition, I give my thanks to Caister Academic Press. I hope and I do believe that the book will be useful to students, scientists and engineers who are interested in extreme microbial research.

Dr Fu-Li Li

Note: Where terms appear in tables, page references are in **bold**; where terms appear in figures, page references are in *italic*.

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Enzymes from extremely thermophilic microorganisms have been of technological interest for some time because of their ability to catalyze reactions of industrial significance at elevated temperatures. Thermophilic enzymes are now routinely produced in recombinant mesophilic hosts for use as discrete biocatalysts. Extremely thermophilic microorganisms as metabolic engineering platforms for production of fuels and industrial chemicals. Voronina, N.G., Voronkina, I.M., Tsaplina, I.A., Yakovleva, M.B., and Rudenskaya, G.N., Prospects of the Application of Enzyme Preparations from *Thermoactinomyces vulgaris* for the Hydrolysis of Casein during Manufacturing Nutrient Media for Microorganisms, *Biologiya termofil'nykh mikroorganizmov (Biology of Thermophilic Microorganisms)*, Imshenetskii, A.A., Ed., Moscow: Nauka, 1986, pp. 251–252. Google Scholar. Thermophilic and thermotolerant microorganisms are of important economic value due to their ability to produce thermostable extracellular enzymes which have important biotechnological applications. It is known that thermophilic activities are generally associated with protein thermostability. Thus, proteins produced by thermophiles tend to be more thermostable than their mesophilic counterparts.