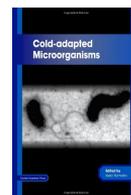


## Cold-adapted Microorganisms

Isao Yumoto (ed.)

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The low temperature environments are dominated on our planet, including oceans and terrestrial soil ecosystems and harbouring diverse microbial communities. The book *Cold-adapted Microorganisms* edited by Isao Yumoto carefully classifies our current knowledge about this specific cold environment area far from human activities and exhibits totally natural ecosystem.

The book is divided into three parts. The first is focused on “Biodiversity in cold ecosystems” and contains very important chapters devoted to bacterial diversity in permafrost among different regions of the world, and information about ecology and taxonomy of psychrotolerant bacteria in artificial cold environments. Both chapters give us relevant news, the second especially for traditional food microbiology. The third chapter refer to psychrophilic microorganisms in marine environments and brings many new data. This part is very useful for all readers interested in marine bacteriology. But it is a pity that authors did not include diversity of Archaea phylum in any of all above mentioned and well written chapters. The last paragraph of the first part is concentrates on mycology in cryosphere. Cold adapted fungi are widely distributed in this environment and authors explained mechanism of their adaptations to this extreme environments. The second part of the book is refer to “Physiology and molecular adaptation mechanisms” and is very extensive. In full detail is described energy metabolism at low temperature, including regulation of the energy and/or respiration, and frozen conditions in cold-adapted microorganisms. The list of microbial genes or proteins whose expression was found up-regulated at low temperatures is mentioned and the first chapter is closed by author view on evolution towards cold adaptation. The next chapter revealed increasing numbers of cold shock proteins and illustrate the mechanisms by which the cellular processes of the psychrophiles survive low temperatures. Cold-adapted enzymes have high flexibilities and could be useful for industrial applications. In consequential chapter authors introduce the expression and function of heat shock proteins and summarize the heat shock response of psychrophilic microorganisms, focusing on how this response starts working at low temperatures and what the features of psychrophilic heat shock proteins are. The second part of the book is finished by chapter describing catalysis, enzyme activity under low temperature, and the protein folding process in psychrophiles at low temperature. The third part of the book is directed on “Biomolecules related to cold” and thoroughly mentioned a few cases in point of psychrotolerant H<sub>2</sub>O<sub>2</sub>-resistant bacteria and environmental adaptation of their catalases. Last but one chapter summarize knowledge of microorganisms in a permafrost ice wedge and their resuscitation-promoting factors. The book is concluded by very important chapter focused on lipids of cell wall in cold-adapted microorganisms and their indispensable role in maintaining of physiological functions of biomembranes.

The book can be used by all readers with interest in psychrophilic or psychrotolerant microorganisms and the great benefit can be expect among professionals in the field of polar microbiology, especially in physiology and ecology of psychrophiles.

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