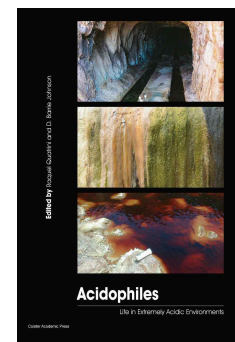


Acidophiles

Life in Extremely Acidic Environments



Edited by: Raquel Quatrini and D. Barrie Johnson

Fundación Ciencia y Vida and Universidad Andres Bello, Santiago, Chile; and Bangor University, UK; respectively

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Acidophiles are life-forms that grow preferentially in natural or man-made environments where the pH is well below seven. Together with other categories of extremophiles, they have greatly expanded our knowledge of the diversity of life, our understanding on how microorganisms can adapt to seemingly hostile situations, and provided scenarios for the possibility that life-forms may be found outside of our solar system.

Written by experts in their field, this important volume provides a comprehensive account of acidophilic microbiology from fundamental to applied aspects. The seventeen chapters are arranged in five sections, each dealing with a specific area. The first section looks at the challenges faced by life-forms that grow in extremely acidic environments and how they adapt to meet these challenges. The next section describes the physiological and phylogenetic diversities of acidophilic microorganisms including archaea, bacteria and eukaryotes. Section three covers acidophile community dynamics, quorum sensing and the formation of biofilms. The next section deals with the various omic technologies that are used to study acidophiles including genomic and metagenomic studies, proteomic-, mobilomic- and metabolomic-focused research. The final section considers the ways in which acidophiles are used in established and emerging biotechnologies and describes why these fascinating microorganisms are considered potential candidates for life on other solar bodies, such as Mars, and beyond.

This up-to-date and comprehensive book will be indispensable for environmental scientists and microbiologists and is a recommended acquisition for all microbiology libraries.

Chapter 1. Acidophile Microbiology in Space and Time (*D. Barrie Johnson and Raquel Quatrini*)

Chapter 2. Energy Acquisition in Low pH Environments (*Wolfgang Nitschke and Violaine Bonnefoy*)

Chapter 3. Adaptation to Extreme Acidity and Osmotic Stress (*Carla M. Zammit and Elizabeth L.J. Watkin*)

Chapter 4. Oxidative Stress and Metal Tolerance in Extreme Acidophiles (*Alonso Ferrer, Omar Orellana and Gloria Levicán*)

Chapter 5. Physiological and Phylogenetic Diversity of Acidophilic Bacteria (*Mark Dopson*)

Chapter 6. Diversity and Physiologies of Acidophilic Archaea (*Olga V. Golyshina, Manuel Ferrer and Peter N. Golyshin*)

Chapter 7. Physiological and Phylogenetic Diversity of Acidophilic Eukaryotes (*Angeles Aguilera, Sanna Olsson and Fernando Puente-Sánchez*)

Chapter 8. Microbial Communities and Interactions in Low pH Environments (*D. Barrie Johnson*)

Chapter 9. Biofilm Formation by Acidophile Bacteria and Archaea (*Alvaro Orell and Nicolas Guiliani*)

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