

Contents

Part I Diversity of Microorganisms

1 Lactic Acid Bacteria	3
Helmut König and Jürgen Fröhlich	
2 Acetic Acid Bacteria	31
José Manuel Guillamón and Albert Mas	
3 Yeasts	47
Linda F. Bisson and C.M. Lucy Joseph	
4 Fungi of Grapes	61
Hanns-Heinz Kassemeyer and Beate Berkelmann-Löhnertz	
5 Phages of Yeast and Bacteria	89
Manfred J. Schmitt, Carlos São-José, and Mário A. Santos	

Part II Primary and Energy Metabolism

6 Sugar Metabolism by <i>Saccharomyces</i> and non-<i>Saccharomyces</i> Yeasts	113
Rosaura Rodicio and Jürgen J. Heinisch	
7 Metabolism of Sugars and Organic Acids by Lactic Acid Bacteria from Wine and Must	135
Gottfried Uden and Tanja Zaunmüller	
8 Transport of Sugars and Sugar Alcohols by Lactic Acid Bacteria	149
Tanja Zaunmüller and Gottfried Uden	

Part III Secondary Metabolism

- 9 Amino Acid Metabolisms and Production of Biogenic Amines and Ethyl Carbamate**..... 167
Massimo Vincenzini, Simona Guerrini, Silvia Mangani, and Lisa Granchi
- 10 Usage and Formation of Sulphur Compounds** 181
Doris Rauhut
- 11 Microbial Formation and Modification of Flavor and Off-Flavor Compounds in Wine** 209
Eveline J. Bartowsky and Isak S. Pretorius
- 12 Pyroglutamic Acid: A Novel Compound in Wines**..... 233
Peter Pfeiffer and Helmut König
- 13 Polysaccharide Production by Grapes, Must, and Wine Microorganisms**..... 241
Marguerite Dols-Lafargue and Aline Lonvaud-Funel
- 14 Exoenzymes of Wine Microorganisms**..... 259
Harald Claus

Part IV Stimulating and Inhibitory Growth Factors

- 15 Physical and Chemical Stress Factors in Yeast**..... 275
Jürgen J. Heinisch and Rosaura Rodicio
- 16 Physical and Chemical Stress Factors in Lactic Acid Bacteria**..... 293
Jean Guzzo and Nicolas Desroche
- 17 Influence of Phenolic Compounds and Tannins on Wine-Related Microorganisms** 307
Helmut Dietrich and Martin S. Pour-Nikfardjam
- 18 Microbial Interactions**..... 335
Leon M.T. Dicks, Svetoslav Todorov, and Akihito Endo

Part V Molecular Biology and Regulation

- 19 Genomics of *Oenococcus oeni* and Other Lactic Acid Bacteria** 351
Angela M. Marcobal and David A. Mills

Contents	xi
20 Genome of <i>Saccharomyces cerevisiae</i> and Related Yeasts	361
Bruno Blondin, Sylvie Dequin, Amparo Querol, and Jean-Luc Legras	
21 The Genome of Acetic Acid Bacteria	379
Armin Ehrenreich	
22 Systems Biology as a Platform for Wine Yeast Strain Development	395
Anthony R. Borneman, Paul J. Chambers, and Isak S. Pretorius	
23 Plasmids from Wine-Related Lactic Acid Bacteria	415
Juan M. Mesas and M. Teresa Alegre	
24 Rapid Detection and Identification with Molecular Methods	429
Jürgen Fröhlich, Helmut König, and Harald Claus	
25 Maintenance of Wine-Associated Microorganisms	451
Helmut König and Beate Berkelmann-Löhnertz	
26 DNA Arrays	469
José E. Pérez-Ortín, Marcel-lí del Olmo, and José García-Martínez	
27 Application of Yeast and Bacteria as Starter Cultures	489
Sibylle Krieger-Weber	
Index	513