



Zdenek Hubálek  
Ivo Rudolf

# Microbial Zoonoses and Sapronoses

 Springer

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Types of Human Disease by Source of the Infectious Agent</b>	<b>5</b>
<b>3</b>	<b>A History of Zoonoses and Saprónoses and Research into Them</b>	<b>9</b>
<b>4</b>	<b>The Infection Process in Zoonoses and Saprónoses</b>	<b>25</b>
4.1	Infectious Agent	25
4.2	Infection Entry	26
4.3	Infection Course and Host Defence	28
<b>5</b>	<b>The Epidemic Process in Zoonoses and Saprónoses</b>	<b>33</b>
5.1	Characteristics of the Epidemic Process	34
5.1.1	The Source of Infection	34
5.1.2	The Transmission Mode of the Infectious Disease	35
5.1.3	Susceptible Population of the Host	37
5.2	External Factors in the Epidemic Process	37
5.2.1	Socio-Economic Factors	37
5.2.2	Environmental (Natural) Factors	39
5.3	Natural Focality of Diseases	41
5.4	Epidemiological Examination in the Focus of an Infectious Disease	44
5.4.1	Descriptive Epidemiological Methods	44
5.4.2	Analytical Epidemiological Methods	45
5.4.3	The Epidemiologists' Activity	46
5.5	Epidemiological Surveillance	46
5.6	The Control of Zoonoses and Saprónoses	48
<b>6</b>	<b>Haematophagous Arthropods as Vectors of Diseases</b>	<b>51</b>
6.1	Characteristics of Transmission of Infection by Arthropods	52
6.2	A Survey of Haematophagous Vectors of Microbial Diseases	55
6.2.1	Ticks and Mites ( <i>Acarina</i> )	55
6.2.2	Lice ( <i>Anoplura</i> )	65
6.2.3	Heteropterans ( <i>Heteroptera</i> )	66

6.2.4	Diptera ( <i>Diptera</i> ) . . . . .	68
6.2.5	Fleas ( <i>Siphonaptera</i> ) . . . . .	77
6.3	A List of Microbial Agents Transmitted by Vectors . . . . .	79
<b>7</b>	<b>Vertebrates as Hosts and Reservoirs of Zoonotic Microbial Agents</b> . . . . .	<b>83</b>
7.1	Mammals (Class <i>Mammalia</i> ) . . . . .	84
7.1.1	Order Pouched Mammals ( <i>Marsupialia</i> ) . . . . .	84
7.1.2	Order Insectivores (Insect-Eaters) ( <i>Insectivora</i> ) . . . . .	85
7.1.3	Order Bats ( <i>Chiroptera</i> ) . . . . .	86
7.1.4	Order Apes ( <i>Primates</i> ) . . . . .	91
7.1.5	Order Carnivores (Flesh-Eaters) ( <i>Carnivora</i> ) . . . . .	92
7.1.6	Order Sloths and Armadillos ( <i>Xenarthra</i> ) . . . . .	98
7.1.7	Order Elephants ( <i>Proboscidea</i> ) . . . . .	98
7.1.8	Order <i>Hyracoidea</i> . . . . .	99
7.1.9	Order Rodents ( <i>Rodentia</i> ) . . . . .	99
7.1.10	Order Lagomorphs (Rabbits, Hares; <i>Lagomorpha</i> ) . . . . .	118
7.1.11	Order Odd-Toed Ungulates ( <i>Perissodactyla</i> ) . . . . .	120
7.1.12	Order Even-Toed Ungulates ( <i>Artiodactyla</i> ) . . . . .	120
7.2	Birds ( <i>Aves</i> ) . . . . .	125
7.3	Reptiles ( <i>Reptilia</i> ) . . . . .	128
7.4	Amphibians ( <i>Amphibia</i> ) . . . . .	128
7.5	Fishes ( <i>Pisces</i> ) . . . . .	128
<b>8</b>	<b>Systematic Survey of Zoonotic and Sapronotic Microbial Agents</b> . . . . .	<b>129</b>
8.1	Prions . . . . .	132
8.1.1	Prion vCJD . . . . .	133
8.2	Viruses . . . . .	133
8.2.1	Family <i>Togaviridae</i> . . . . .	135
8.2.2	Family <i>Flaviviridae</i> . . . . .	142
8.2.3	Family <i>Bunyaviridae</i> . . . . .	156
8.2.4	Family <i>Reoviridae</i> . . . . .	167
8.2.5	Family <i>Rhabdoviridae</i> . . . . .	170
8.2.6	Family <i>Arenaviridae</i> . . . . .	173
8.2.7	Family <i>Filoviridae</i> . . . . .	178
8.2.8	Family <i>Orthomyxoviridae</i> . . . . .	181
8.2.9	Family <i>Paramyxoviridae</i> . . . . .	183
8.2.10	Family <i>Bornaviridae</i> . . . . .	186
8.2.11	Family <i>Coronaviridae</i> . . . . .	186
8.2.12	Family <i>Picornaviridae</i> . . . . .	187
8.2.13	Family <i>Caliciviridae</i> . . . . .	188
8.2.14	Family <i>Hepeviridae</i> . . . . .	188
8.2.15	Family <i>Retroviridae</i> . . . . .	189
8.2.16	Family <i>Herpesviridae</i> . . . . .	190
8.2.17	Family <i>Poxviridae</i> . . . . .	191

8.3	Bacteria	194
8.3.1	Family <i>Chlamydiaceae</i>	194
8.3.2	Family <i>Parachlamydiaceae</i>	196
8.3.3	Family <i>Simkaniaceae</i>	196
8.3.4	Family <i>Waddliaceae</i>	197
8.3.5	Family <i>Rickettsiaceae</i>	197
8.3.6	Family <i>Anaplasmataceae</i>	207
8.3.7	Family <i>Bartonellaceae</i>	210
8.3.8	Family <i>Brucellaceae</i>	214
8.3.9	Family <i>Francisellaceae</i>	215
8.3.10	Family <i>Legionellaceae</i>	217
8.3.11	Family <i>Coxiellaceae</i>	219
8.3.12	Family <i>Enterobacteriaceae</i>	221
8.3.13	Family <i>Pasteurellaceae</i>	228
8.3.14	Family <i>Vibrionaceae</i>	229
8.3.15	Family <i>Aeromonadaceae</i>	231
8.3.16	Family <i>Campylobacteraceae</i>	232
8.3.17	Family <i>Helicobacteraceae</i>	233
8.3.18	Family <i>Leptospiraceae</i>	233
8.3.19	Family <i>Spirochaetaceae</i>	235
8.3.20	Family <i>Serpulinaceae</i>	239
8.3.21	Family <i>Flavobacteriaceae</i>	239
8.3.22	Family <i>Burkholderiaceae</i>	240
8.3.23	Family <i>Neisseriaceae</i>	242
8.3.24	Family <i>Spirillaceae</i>	242
8.3.25	Family <i>Fusobacteriaceae</i>	243
8.3.26	Family <i>Erysipelotrichaceae</i>	244
8.3.27	Family <i>Listeriaceae</i>	245
8.3.28	Family <i>Bacillaceae</i>	246
8.3.29	Family <i>Staphylococcaceae</i>	247
8.3.30	Family <i>Streptococcaceae</i>	248
8.3.31	Family <i>Clostridiaceae</i>	251
8.3.32	Family <i>Mycobacteriaceae</i>	253
8.3.33	Family <i>Corynebacteriaceae</i>	259
8.3.34	Family <i>Actinomycetaceae</i>	260
8.3.35	Family <i>Nocardiaceae</i>	260
8.3.36	Families <i>Thermomonosporaceae</i> , <i>Streptomycetaceae</i>	261
8.3.37	Family <i>Dermatophilaceae</i>	262
8.4	Fungi	262
8.4.1	Family <i>Arthrodermataceae</i>	263
8.4.2	Family <i>Gymnoascaceae</i>	265
8.4.3	Family <i>Ajellomycetaceae</i>	266
8.4.4	Family <i>Ophiostomataceae</i>	269
8.4.5	Family <i>Eurotiaceae</i>	270
8.4.6	Family <i>Hypocreaceae</i>	271

8.4.7	Order <i>Dothideales</i> . . . . .	272
8.4.8	“Family” <i>Dematiaceae</i> . . . . .	272
8.4.9	Family <i>Mucoraceae</i> . . . . .	274
8.4.10	Family <i>Entomophthoraceae</i> . . . . .	274
8.4.11	Family <i>Filobasidiaceae</i> . . . . .	274
8.4.12	Order <i>Ustilaginales</i> . . . . .	276
8.4.13	Family <i>Pythiaceae</i> . . . . .	276
8.5	Protozoa . . . . .	277
8.5.1	Family <i>Trypanosomatidae</i> . . . . .	277
8.5.2	Family <i>Hexamitidae</i> . . . . .	282
8.5.3	Family <i>Vahlkampfiidae</i> . . . . .	283
8.5.4	Family <i>Acanthamoebidae</i> . . . . .	284
8.5.5	Family <i>Leptomixidae</i> . . . . .	284
8.5.6	Family <i>Thecamoebidae</i> . . . . .	285
8.5.7	Family <i>Eimeriidae</i> . . . . .	285
8.5.8	Family <i>Sarcocystidae</i> . . . . .	286
8.5.9	Family <i>Cryptosporidiidae</i> . . . . .	288
8.5.10	Family <i>Plasmodiidae</i> . . . . .	289
8.5.11	Family <i>Babesiidae</i> . . . . .	291
8.5.12	Family <i>Balantidiidae</i> . . . . .	292
8.6	Other Eucaryotic Microorganisms . . . . .	293
8.6.1	Algae . . . . .	293
8.6.2	Blastocystea . . . . .	294
8.6.3	Microsporidia . . . . .	294
8.6.4	Dermocystida . . . . .	296
	<b>Photographs</b> . . . . .	<b>299</b>
	<b>Authors of Photographs</b> . . . . .	<b>397</b>
	<b>Literature</b> . . . . .	<b>399</b>
	<b>Selected Sources for Zoonoses and Sapronoses on Internet</b> . . . . .	<b>403</b>
	<b>Index</b> . . . . .	<b>405</b>