

# Contents

<b>1</b>	<b>The Phenomenon Parasitism . . . . .</b>	<b>1</b>
1.1	Host Specificity . . . . .	3
1.2	Ontogenetic Development of Parasites . . . . .	3
1.3	Follow-Up of Different Generations . . . . .	4
1.4	Speed of Development . . . . .	4
1.5	Adaptations . . . . .	5
1.6	Pathogenicity . . . . .	7
1.7	Diseases . . . . .	8
1.8	Parasite Diagnosis . . . . .	8
	Further Reading . . . . .	11
<b>2</b>	<b>Which Parasites Are Important for Humans? . . . . .</b>	<b>13</b>
2.1	Groups of Parasites . . . . .	13
2.2	Organs of Humans and Their Typical (Common) Parasites . . . . .	15
<b>3</b>	<b>Protozoans Attacking Humans . . . . .</b>	<b>19</b>
3.1	History and Relations . . . . .	19
3.2	<i>Trichomonas vaginalis</i> (Trichomoniasis) . . . . .	20
3.3	Flagellata of the Intestine . . . . .	24
3.3.1	<i>Trichomonas tenax</i> . . . . .	26
3.3.2	<i>Entamoeba gingivalis</i> . . . . .	26
3.4	<i>Giardia lamblia</i> (syn. <i>G. duodenalis</i> , <i>G. intestinalis</i> ) . . . . .	27
3.5	<i>Trypanosoma brucei</i> Group (African Trypanosomiasis) . . . . .	30
3.6	South American Trypanosomes . . . . .	37
3.6.1	<i>Trypanosoma cruzi</i> (Chagas' Disease) . . . . .	37
3.6.2	<i>Trypanosoma rangeli</i> . . . . .	42
3.7	<i>Leishmania</i> species (Agents of the Skin, Mucosa and American Leishmaniasis) . . . . .	43
3.8	<i>Leishmania donovani</i> complex (Visceral Leishmaniasis) . . . . .	52
3.9	<i>Entamoeba histolytica</i> (Entamobiasis, Amoebiasis and Bloody Flu) . . . . .	55

3.10	Facultatively Pathogenic Amoebae . . . . .	61
3.10.1	Species of the Genera <i>Acanthamoeba</i> , <i>Naegleria</i> and <i>Balamuthia</i> . . . . .	61
3.10.2	<i>Dientamoeba fragilis</i> . . . . .	65
3.10.3	Apathogenic Amoebae or with a Low-Grade Pathogenicity . . . . .	67
3.11	<i>Isospora belli</i> . . . . .	68
3.12	<i>Cyclospora cayetanensis</i> (Cyclosporiasis) . . . . .	70
3.13	<i>Cryptosporidium</i> Species (Cryptosporidiosis) . . . . .	72
3.14	Sarcosporidia . . . . .	77
3.14.1	<i>Sarcocystis</i> Species Inside the Human Intestine ( <i>S. suis</i> , <i>S. bovis</i> ) . . . . .	77
3.14.2	<i>Sarcocystis</i> Species in Human Muscles . . . . .	81
3.15	<i>Toxoplasma gondii</i> (Toxoplasmosis) . . . . .	83
3.16	<i>Plasmodium</i> Species (Malaria) . . . . .	92
3.17	<i>Babesia</i> Species (Babesiosis, Babesiosis) . . . . .	113
3.18	<i>Balantidium coli</i> (Balantidiasis) . . . . .	116
3.19	<i>Pneumocystis jiroveci</i> (Pneumocystosis) . . . . .	119
3.20	<i>Blastocystis</i> Species (Blastocystosis) . . . . .	121
3.21	Microsporidia . . . . .	123
3.21.1	<i>Enterocytozoon bieneusi</i> (Enterocytozoonosis) . . . . .	123
3.21.2	<i>Septata intestinalis</i> . . . . .	125
3.22	<i>Encephalitozoon cuniculi</i> (Encephalitozoonosis) . . . . .	126
3.23	<i>Encephalitozoon intestinalis</i> (Encephalitozoonosis) . . . . .	127
3.24	<i>Nosema connori</i> (syn. <i>conneri</i> ) (Nosematosis) . . . . .	128
	Further Reading (Joint List for This Chapter) . . . . .	128
4	<b>Worms of Humans</b> . . . . .	135
4.1	What Are Worms? . . . . .	135
4.2	Trematodes (Flukes) . . . . .	135
4.2.1	<i>Schistosoma haematobium</i> , Bladder Fluke (Bladder bilharziasis) . . . . .	137
4.2.2	<i>Schistosoma mansoni</i> and Other Species (Intestinal Bilharziasis, i.e. Intestinal Schistosomiasis) . . . . .	144
4.2.3	<i>Clonorchis</i> and <i>Opisthorchis</i> Species, Chinese River Fluke (Clonorchiasis, Opisthorchiasis) . . . . .	149
4.2.4	<i>Paragonimus</i> Species (Paragonimiasis) . . . . .	157
4.2.5	<i>Fasciolopsis buski</i> (Fasciolopsiasis) . . . . .	160
4.2.6	<i>Fasciola hepatica</i> (Fascioliasis) . . . . .	164
4.2.7	<i>Dicrocoelium dendriticum</i> (syn. <i>lanceolatum</i> ) (Dicrocoeliasis) . . . . .	166
4.2.8	<i>Heterophyes</i> Species (Heterophyiasis) . . . . .	168
4.2.9	<i>Metagonimus yokogawai</i> and Related Species (Metagonimiasis) . . . . .	169
4.2.10	<i>Echinostoma</i> Species (Echinostomiasis) . . . . .	170

4.2.11	<i>Gastrodiscoides hominis</i> and Related Species (Gastrodiscoidiasis) . . . . .	173
4.2.12	<i>Watsonius watsoni</i> (Watsoniasis) . . . . .	174
4.2.13	<i>Nanophyetus</i> Species (Nanophyetiasis) . . . . .	175
4.2.14	<i>Metorchis conjunctus</i> (Meteorchiasis) . . . . .	176
4.2.15	<i>Philophthalmus</i> Species . . . . .	176
4.3	Tapeworms (Cestodes) . . . . .	177
4.3.1	<i>Taenia solium</i> , <i>T. asiatica</i> (Pork Tapeworm) (Taeniasis) . . . . .	178
4.3.2	<i>Taenia saginata</i> (Cattle Tapeworm) (Taeniasis) . . . . .	185
4.3.3	<i>Diphyllobothrium latum</i> Species (Broad Tapeworm) (Diphyllobothriasis) . . . . .	186
4.3.4	<i>Hymenolepis nana</i> and Other Species (Hymenolepiasis) . . . . .	191
4.3.5	<i>Echinococcus</i> Species (Echinococciasis) . . . . .	195
4.3.6	<i>Dipylidium caninum</i> . . . . .	201
4.3.7	Rare Tapeworms in the Intestine of Humans . . . . .	204
4.3.8	<i>Cysticercus</i> Species (Cysticerciasis) . . . . .	205
4.3.9	<i>Coenurus</i> Species . . . . .	207
4.4	Nematodes (Nematozoa, Roundworms) . . . . .	208
4.4.1	<i>Enterobius vermicularis</i> (Enterobiasis) . . . . .	211
4.4.2	<i>Ascaris lumbricoides</i> (Ascariasis) . . . . .	214
4.4.3	<i>Trichuris trichiura</i> (Trichuriasis) . . . . .	217
4.4.4	<i>Ancylostoma</i> and <i>Necator</i> Species (Hookworm Disease, Ancylostomiasis, Necatoriasis) . . .	218
4.4.5	<i>Strongyloides stercoralis</i> . . . . .	223
4.4.6	<i>Capillaria</i> Species (Capillariasis) . . . . .	227
4.4.7	<i>Trichinella spiralis</i> and Related Species (Trichinellosis) . . . . .	229
4.4.8	<i>Angiostrongylus cantonensis</i> (Angiostrongyliasis) . . . .	233
4.4.9	<i>Angiostrongylus costaricensis</i> (Angiostrongyliasis) . . .	237
4.4.10	<i>Anisakis</i> Species and Related Species (Anisakiasis) . . .	238
4.4.11	<i>Gnathostoma</i> Species (Gnathostomiasis) . . . . .	241
4.4.12	<i>Toxocara</i> Species (Toxocariasis) . . . . .	244
4.4.13	<i>Dictyophyme renale</i> (Dictyophymiasis) . . . . .	247
4.4.14	<i>Ternidens deminutus</i> (syn. <i>Triodontophorus deminutus</i> , <i>Globocephalus macaci</i> ) (Ternidens Disease) . . . . .	248
4.4.15	<i>Trichostrongylus</i> Species (Trichostrongyliasis) . . . . .	249
4.4.16	<i>Wuchereria bancrofti</i> (Lymphatic Filariasis) . . . . .	250
4.4.17	<i>Brugia malayi</i> (Lymphatic Filariasis) . . . . .	257
4.4.18	<i>Loa loa</i> (Loiasis) . . . . .	258
4.4.19	<i>Onchocerca volvulus</i> (Onchocerciasis) . . . . .	261
4.4.20	<i>Mansonella</i> Species (Mansonelliasis) . . . . .	265
4.4.21	<i>Dirofilaria</i> Species (Dirofilariasis) . . . . .	268

4.4.22	<i>Dracunculus medinensis</i> (Dracontiasis) . . . . .	270
4.4.23	Wandering Nematodes in Humans . . . . .	272
4.4.24	Microfilariae: Larvae of Filarial Nematodes . . . . .	272
4.4.25	Skin Mole (Creeping Eruption, Larva Migrans Cutanea) . . . . .	273
4.4.26	<i>Thelazia</i> Species (Thelaziasis) . . . . .	274
4.5	Worms Belonging to Further Animal Phyla . . . . .	275
4.5.1	Pentastomida (Pentastomiasis) . . . . .	275
4.5.2	<i>Macracanthorhynchus hirudinaceus</i> (Acanthocephaliasis) . . . . .	278
4.5.3	Leeches (Annelida) . . . . .	283
4.6	Available Compounds, Methods and Means to Control Protozoan and Helminthic Parasites . . . . .	286
	Further Reading (Joint List for This Chapter) . . . . .	288
<b>5</b>	<b>Arthropods . . . . .</b>	<b>299</b>
5.1	Scorpions . . . . .	300
5.2	Spiders (Arachnida) . . . . .	303
5.3	Ticks . . . . .	306
5.3.1	Hard Ticks (Ixodidae) . . . . .	318
5.3.2	Argasidae (So-Called Soft or Leather Ticks) . . . . .	320
5.3.3	Skin Reactions After Tick Bites . . . . .	321
5.3.4	Tick Paralysis . . . . .	323
5.3.5	Treatment of Tick Bites . . . . .	325
5.3.6	Transmission of Agents of Disease . . . . .	325
5.3.7	Protection from Tick Bites . . . . .	333
5.3.8	Further Reading (Tick) . . . . .	333
5.4	Mites . . . . .	337
5.4.1	Chicken Mites (Dermanyssidae) . . . . .	337
5.4.2	Rat Mites (Liponyssidae) and Related Species . . . . .	339
5.4.3	Trombiculidae (Chigger Mites) . . . . .	341
5.4.4	Fur Mites (Cheyletiellidae) . . . . .	345
5.4.5	Scabies Mites (Sarcoptidae) . . . . .	347
5.4.6	Follicle Mites (Demodicidae) . . . . .	351
5.4.7	House Dust Mites (Tyroglyphidae) . . . . .	353
5.5	Insects (Insecta, Hexapoda) . . . . .	355
5.5.1	Fleas (Siphonaptera) . . . . .	358
5.5.2	Lice (Phthiraptera) . . . . .	371
5.5.3	Bugs . . . . .	384
5.5.4	Mosquitoes (Nematocera) . . . . .	390
5.5.5	Flies (Brachycera) . . . . .	408
5.5.6	Horse Flies (Tabanidae) . . . . .	420
5.6	Protection from Insect Infestation . . . . .	423
5.6.1	Protection from Mosquitoes . . . . .	423
5.6.2	Protection from Flies . . . . .	425

---

5.7	Vampire Fish . . . . .	425
5.8	Vampire Bats . . . . .	426
	Further Reading (Joint List for This Chapter) . . . . .	426
	<b>Questions to Test Obtained Knowledge . . . . .</b>	<b>435</b>
	Solutions . . . . .	444
	<b>Origin of Figures . . . . .</b>	<b>445</b>
	Photographs . . . . .	445
	Diagrammatic Representations . . . . .	445
	<b>Author Index . . . . .</b>	<b>447</b>
	<b>Subject Index . . . . .</b>	<b>449</b>

Human Parasites

Diagnosis, Treatment, Prevention

Mehlhorn, H.

2016, XVII, 461 p. 221 illus., 215 illus. in color.,

Hardcover

ISBN: 978-3-319-32801-0