

A Diagnostic Manual for Parasites of Veterinary Importance

Parasitic infections are a major global concern, adversely affects animal health and responsible for significant economic losses in terms of decreased milk production, meat quality, depreciation of hide, manure and draught power. A precise and confirmatory diagnosis is required for specific treatment of ecto- and endo-parasites. Morphological identification of parasites is an old but gold standard method for diagnosis. This is also more economical over advanced diagnostic methods where sophisticated laboratories with expensive instruments and chemicals are required.

A book explaining specific identification characters and images of parasites provide synergism in diagnosis. There is a need of a book for cost-effective and field-oriented Veterinary Medical Practitioner's friendly diagnosis of parasites without using costly molecular biology tools. The present book "A Diagnostic Manual for Parasites of Veterinary Importance" is prepared with aims to provide a comprehensive approach used in the diagnosis of parasites in a summarized way with their microscopic images.

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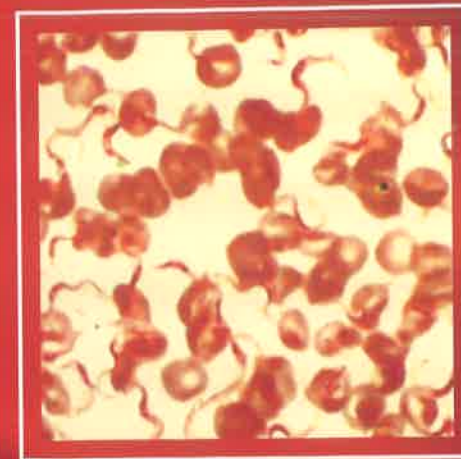


Rs. 2450.00

A Diagnostic Manual for **Parasites of Veterinary Importance**
Amit Kumar Jaiswal Pradeep Kumar Daya Shanker



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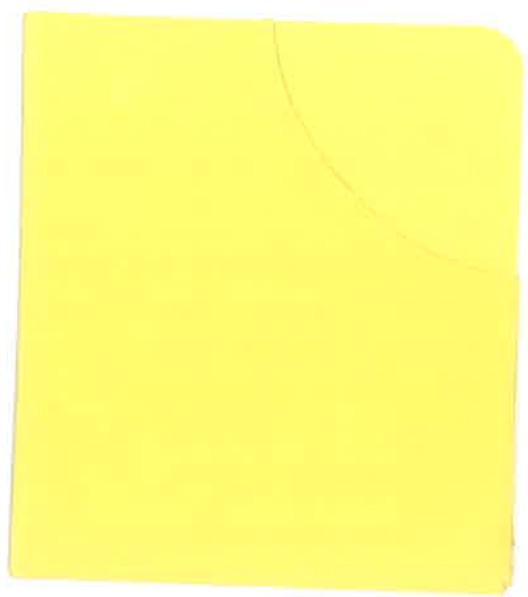


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Published by :

International Books & Periodical Supply Service

(Publisher of Scientific Books)

38, NISHANT KUNJ, PITAM PURA MAIN ROAD

DELHI-110034 (India)

Phone : 011-27352078, Mobile : 09810146811, E-mail : hkjain1975@yahoo.com

© Publisher

ISBN : 978-93-88892-73-5

E-ISBN : 978-93-88892-74-2

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Composed, Designed & Printed in India

Foreword

The Book entitled "A Diagnostic Manual for Parasites of Veterinary Importance", a fundamental manuscript for veterinary parasitologists and technical person deals with parasites of veterinary importance. The first section of this book includes different techniques used for the diagnosis of parasites and its stages in the animals. The rest sections include helminths, arthropods and protozoan parasites with specific hosts, their morphological characters, clinical signs and diagnosis. A rare collection of parasite images showing morphological characters will help to identify the parasites by veterinary professionals and also increase the importance of this book.

The tremendous efforts of authors for the collection and incorporation of parasite images in this book are excellent. I am confident that the information available in this book would be of immense help to students, faculty, scientists, field veterinarians and laboratory personals involved in the diagnosis, teaching and research.

I greatly value the efforts made by all the authors of this book and wish all success in their future endeavours and academic pursuits.

Date : 20-11-2019

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Foreword

I am very happy to know that Dr(s). Amit Kumar Jaiswal, Pradeep Kumar and Daya Shanker have prepared the book entitled "A Diagnostic Manual for Parasites of Veterinary Importance" for veterinary professionals involved in the field of veterinary parasitology. The book summarizes detailed information about the conventional diagnostic methods along with photographs of eggs and parasites in an endeavour to help the readers to easily identify the parasites.

The book contains actual images of the common parasites of veterinary importance and methods of preparation of different solutions used in a diagnostic laboratory.

I am sure this book will enhance the knowledge and skills of students, faculty, scientists, field veterinarian and laboratory technicians involved in diagnosis, teaching and research.

I heartily congratulate all the authors of this book and wish all success in their future endeavours and academic pursuits.

Satish K. Garg

Preface

Parasites are responsible for significant economic losses to the animal industry in terms of milk, meat, hide, manure and draught power. The crude method for diagnosis of parasitic diseases is based on clinical signs but has its limitations. To overcome these limitations laboratory diagnosis is required. Identification of parasite and their stages by morphology gives sure shot diagnosis but has a tedious job and require an expert eye. Keeping this situation the present book "A Diagnostic Manual for Parasites of Veterinary Importance" is prepared.

The present book comprises four different sections. The section I include a detailed description of different diagnostic methods used for diagnosis of various ecto and endo-parasites of animal origin. Morphological characters, important clinical signs, diagnostic methods of helminth parasites are included in section II of this book. Like this section III and IV includes important morphological characters, hosts, clinical signs and diagnosis of arthropods and protozoa respectively. Book includes the rarest collection of various parasites image. This book also provides basic information for preparation of reagents, chemicals and stains used in laboratory diagnosis of parasites.

We hope, this book will be useful for veterinary parasitologist, field veterinarian, research students, teachers, and scientists involved in laboratory diagnosis of animal parasites. We also appreciate the contribution of staff of Department of Veterinary Parasitology especially Mr. Manoj Kumar, Lab. Assistant for help in preparation of parasite mounts and clicking photographs of parasites for designing of this manuscript.

**Amit Kumar Jaiswal
Pradeep Kumar
Daya Shanker**

Contents

Foreword (Prof. G. K. Singh)	v
Foreword (Prof. (Dr.) Satish K. Garg)	vii
Preface	ix

Section 1

Diagnostic Techniques	1
Collection of faecal sample	1
Transportation of the sample	2
Gross examination of faeces	2
Microscopic examination	3
Faecal culture	8
Examination of blood	10
Examination of Nasal discharges	14
Examination of Urine	14
Examination of skin for parasites	14
Examination of parasites in miscellaneous locations	15

Section 2

Identification of Helminth Parasites	17
TREMATODES	17
<i>Genus / Genera</i>	
Dicrocoelium	17
Eurytrema	18
Heterophyes	18
Prosthogonimus	19
Opisthorchis	19
Clonorchis	20
Fasciola	20
Fasciolopsis	22
Echinostoma	22
Paragonimus	23
Ogmocotyle	24

Paramphistomum	24
Cotylophoron	25
Calicophoron	25
Gigantocotyle	26
Gastrothylax	26
Fischoederius	27
Carmyerius	27
Gastrodiscus	28
Gastrodiscoides	28
Pseudodiscus	28
Schistosoma	29
Ornithobilharzia	31
CESTODES	32
<i>Genus / Genera</i>	
Anoplocephala	32
Paranoplocephala	34
Moniezia	34
Avitellina	36
Stilesia	37
Thysanosoma	38
Thysaniezia	39
Davainea	40
Cotugnia	40
Raillietina	41
Amoebotaenia	42
Choanotaenia	44
Dipylidium	45
Hymenolepis	46
Taenia	47
Echinococcus	49
Diphyllobothrium	50
NEMATODES	52
<i>Genus / Genera</i>	
Ascaris	52
Parascaris	52

Toxocara	53
Toxascaris	55
Ascaridia	55
Heterakis	56
Oxyuris	57
Strongyloides	58
Strongylus	58
Chabertia	60
Oesophagostomum	60
Syngamus	61
Stephanurus	62
Ancylostoma	63
Gaigeria	64
Bunostomum	65
Trichostrongylus	65
Ostertagia	66
Cooperia	67
Paracooperia	67
Nematodirus	68
Haemonchus	68
Mecistocirrus	69
Dictyocaulus	70
Protostrongylus	71
Muellerius	71
Metastrongylus	72
Habronema	73
Draschia	74
Thelazia	74
Oxyspirura	75
Spirocerca	76
Ascarops	76
Physocephalus	77
Gongylonema	78
Dirofilaria	78
Parafilaria	79

Setaria	80
Stephanofilaria	80
Onchocerca	81
Dracunculus	82
Trichinella	83
Trichuris	84
Macracanthorhynchus	84

Section 3

Identification of arthropod parasites 87

POULTRY LICE

Genus / Genera

Lipeurus	87
Menacanthus	87
Goniodes	88
Menopon	88
Columbicola	88

MAMMALIAN LICE 89

Genus / Genera

Damalinia	89
Trichodectes	89
Haematopinus	90
Linognathus	90

BUGS 91

Genus / Genera

Cimex	91
Triatoma	91

FLEAS 92

Genus / Genera

Ctenocephalides	92
Ctenocephalides	92
Echidnophaga	92
Xenopsylla	92
Pulex	92

FLIES 93

Genus / Genera

Anopheline	93
Culicine	94
Culicoides	95
Simulium	96
Phlebotomus	97
Tabanus	97
Chrysops	98
Haematopota	98
Gasterophilus	99
Musca	100
Stomoxys	101
Glossina	102
Calliphorinae (Lucilia, Calliphora, Phormia, Chrysomyia, Sarcophaga)	103
Hypoderma	108
Oestrus	109
Hippobosca	110
Melophagus	110
Pseudolynchia	111
ARACHNIDS	111
<i>Genus / Genera</i>	
Demodex	111
Sarcoptes	112
Psoroptes	112
Otodectis	113
Argus	113
Ixodes	114
Boophilus	114
Rhipicephalus	114
Haemaphysalis	115
Hyalomma	115
Dermacentor	115
Amblyomma	116
Pentastomatid	117

Section 4

Identification of Protozoan Parasites	119
<i>Genus / Genera</i>	
Trypanosoma	119
Leishmania	120
Giardia	121
Tritrichomonas	122
Entamoeba	124
Eimeria	126
Isospora	127
Sarcocystis	127
Toxoplasma	128
Hepatozoon	129
Plasmodium	129
Haemoproteus	130
Leucocytozoon	131
Babesia	132
Theileria	133
Balantidium	135
Buxtonella	136
Anaplasma	137
Ehrlichia	138

Section 5

Preparation of Solutions / Reagents for Diagnosis of Parasites	141
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Section 1

Diagnostic Techniques

Diagnosis of parasitic infections in animals is a challenging but interesting job that involves the recognition of parasitic stages based on its size, morphology, colour and movement. Size and morphology of parasite and its stages are the major diagnostic parameters for identification. Parasites set up itself in different locations of body like the gastrointestinal (GI) tract, liver, kidney, respiratory tract, blood, etc. Each parasite and parasitic stages have their specific morphological features by which it can be differentiated from others. Different diagnostic procedures for parasites are based on the detection and identification of their developmental stages (eggs, larvae, cysts, and nits) and adults in different systems/organs of the body. A host infected with parasites releases the developmental stages or adult parasites or both in its body excretions and secretions like faeces, nasal discharge, urine, blood, etc. System-wise diagnosis of the parasitism can be divided into following:

Diagnosis of parasites located in gastro-intestinal (GI) tract

The GI parasites discharge its eggs, larva, adult worms and proglottids from the faeces of the infected host. The procedure for the diagnosis of parasite/parasitic stages from faeces includes collection and examination of faeces.

A. Collection of faeces

Always a fresh faecal sample should prefer to examine for the diagnosis of parasites/stages. A faecal sample should be preferably collected per rectum i.e. directly from the rectum and stored in airtight containers to prevent further development. Faeces collection from larger animals is comparatively easy than from smaller animals. Smaller animals, such as kid and lambs can be induced to defecate by inserting a moistened finger into the rectum and gentle massaging until the external sphincter relaxes. An older faecal sample gives foul smell and