

VOLUME 63 PART 1 AUGUST 1971

# PARASITOLOGY

FOUNDED BY G. H. F. NUTTALL



**CAMBRIDGE UNIVERSITY PRESS**

**BENTLEY HOUSE, 200 EUSTON ROAD, LONDON NW1 2DB**

**AMERICAN BRANCH: 32 EAST 57TH STREET, NEW YORK, N.Y. 10022**

*Subscription per volume: £7.00 net (\$23.00) (3 parts)*

*Single parts: £3.00 net (\$9.50)*

# PARASITOLOGY

EDITOR

H. D. CROFTON,

Department of Zoology, University of Bristol, Bristol

EDITORIAL BOARD

GWENDOLEN REES, F.R.S. (*Chairman*)

D. R. ARTHUR

D. L. LEE\*

S. COHEN

J. LLEWELLYN

C. ELLENBY

W. F. MAI

L. G. GOODWIN

B. A. NEWTON

C. A. HOARE, F.R.S.

C. P. READ

C. A. HOPKINS

S. R. SMITHERS

P. TATE

\* representing the British Society for Parasitology

EDITORIAL PANEL

The Editor is also assisted in the refereeing and editing of papers by the following:

R. A. AVERY

BRIDGET M. OGILVIE

D. A. ERASMUS

M. ELAINE ROSE

L. P. JOYNER

G. SALT, F.R.S.

ELSPETH W. McCONNACHIE

G. I. SHARPE

J. SMART

---

PARASITOLOGY publishes original work on parasitology. The scope of the Journal includes papers on morphology, cytology, histochemistry and fine structures; physiology, biochemistry and chemotherapy; the ecology, life cycle and taxonomy of parasites and their vectors.

PARASITOLOGY is published once every two months. Each volume consists of three parts (published in February, April, June, August, October and December) plus an index.

SUBSCRIPTIONS may be sent to any bookseller or subscription agent or direct to Cambridge University Press, P.O. Box 92, London N.W.1. Subscriptions in the U.S.A. should be sent to Cambridge University Press, 32 East 57th Street, New York, N.Y. 10022. The subscription price is £7.00 net (including postage) for a volume of three parts (\$23.00 in the U.S.A.), payable in advance; separate parts cost £3.00 net or \$9.50 each (plus postage).

SECOND CLASS POSTAGE PAID AT NEW YORK, N.Y.

BACK VOLUMES. Vols. 1—39: Inquiries should be addressed to Wm Dawson & Sons Ltd, Cannon House, Folkestone, Kent. Vols. 40 onwards: Quotations for parts still in print may be obtained from the London or New York offices of the Cambridge University Press.

**Contributors are strongly urged to study the notes for their guidance printed inside the back cover and to follow the recommendations set out there.**

# PARASITOLOGY

# PARASITOLOGY

(*Founded by G. H. F. Nuttall, F.R.S.*)

EDITOR

H. D. CROFTON

EDITORIAL BOARD

GWENDOLEN REES, F.R.S. (*Chairman*)

D. R. ARTHUR

D. L. LEE\*

S. COHEN

J. LLEWELLYN

C. ELLENBY

W. F. MAI

L. G. GOODWIN

B. A. NEWTON

C. A. HOARE, F.R.S.

C. P. READ

C. A. HOPKINS

S. R. SMITHERS

P. TATE

\* representing the British Society for Parasitology

EDITORIAL PANEL

The Editor is also assisted in the refereeing and editing of papers by the following:

R. A. AVERY

BRIDGET M. OGILVIE

D. A. ERASMUS

M. ELAINE ROSE

L. P. JOYNER

G. SALT, F.R.S.

ELSPETH W. McCONNACHIE

G. I. SHARPE

J. SMART

VOLUME 63, 1971

CAMBRIDGE

AT THE UNIVERSITY PRESS

1971

**PUBLISHED BY**  
**THE SYNDICS OF THE UNIVERSITY PRESS**  
Bentley House, 200 Euston Road, London N.W. 1.  
American Branch: 32 East 57th Street, New York, N.Y. 10022

# CONTENTS

(All rights reserved)

## PART I, AUGUST 1971

	PAGE
SCORZA, J. V. Electron microscope study of the blood stages of <i>Plasmodium tropiduri</i> , a lizard malaria parasite. (With 6 Plates) . . . . .	1
FERNANDO, M. A., STOCKDALE, P. H. G. and ASHTON, G. C. Factors contributing to the retardation of development of <i>Obeliscooides cuniculi</i> in rabbits. (With 3 Figures in the Text) . . . . .	21
CHEERNIN, E. and BOWER, CAROL. Experimental transmission of <i>Schistosoma mansoni</i> in brackish waters . . . . .	31
SPRENT, J. F. A. A new genus and species of ascaridoid nematode from the marsupial wolf ( <i>Thylacinus cynocephalus</i> ). (With 1 Plate and 14 Figures in the Text) . . . . .	37
SPRENT, J. F. A. A note on <i>Lagochilascaris</i> from the cat in Argentina. (With 10 Figures in the Text) . . . . .	45
WHITFIELD, P. J. Phylogenetic affinities of Acanthocephala: an assessment of ultrastructural evidence. (With 1 Plate and 2 Figures in the Text) . . . . .	49
KENNEDY, C. R. The effect of temperature upon the establishment and survival of the cestode <i>Caryophyllaeus laticeps</i> in orfe, <i>Leuciscus idus</i> . (With 2 Figures in the Text) . . . . .	59
GRAY, A. R. and ROBERTS, C. J. The cyclical transmission of strains of <i>Trypanosoma congolense</i> and <i>T. vivax</i> resistant to normal therapeutic doses of trypanocidal drugs . . . . .	67
SCHMIDT, G. D. and KUNTZ, R. E. Nematode parasites of Oceanica. XIII. Subuluridae, Thelaziidae and Ascaridiidae of birds. (With 23 Figures in the Text)	91
SNOW, K. R. Identification of the larvae of <i>Hyalomma</i> ( <i>Hyalomma</i> ) <i>anatolicum</i> subspecies (Ixodoidea: Ixodidae) with special reference to chaetotaxy. (With 12 Figures in the Text) . . . . .	101
ALPHEY, T. J. W. Studies on the aggregation behaviour of <i>Nippostrongylus brasiliensis</i> . (With 2 Figures in the Text) . . . . .	109
BECKETT, EVELYN B. The distribution of developing <i>Brugia pahangi</i> and <i>Brugia malayi</i> larvae within the dorsal longitudinal flight muscles of <i>Aedes aegypti</i> and <i>Mansonia uniformis</i> . (With 1 Figure in the Text) . . . . .	119
READER, T. A. J. Histochemical observations on carbohydrates, lipids and enzymes in digenean parasites and host tissues of <i>Bithynia tentaculata</i> . (With 3 Plates) . . . . .	125
HUDSON, K. ELAINE. The form and function of the oesophageal region of the insect parasite <i>Tetradonema plicans</i> (Nematoda: Tetradonematidae). (With 4 Plates and 1 Figure in the Text) . . . . .	137

	PAGE
WILSON, R. J. M. Effects of methotrexate on the parasitic development of the nematode <i>Dictyocaulus viviparus</i> (Metastrongylidae), and on the immune response of infected guinea-pigs. (With 7 Figures in the Text) . . . . .	145
KEARN, G. C. The attachment of the ancyrocephalid monogenean <i>Haliotrema balisticus</i> to the gills of the trigger fish, <i>Balistes capriscus</i> (= <i>carolinensis</i> ). (With 2 Figures in the Text) . . . . .	157
GRAY, A. R. and ROBERTS, C. J. The stability of resistance to diminazene aceturate and quinapyramine sulphate in a strain of <i>Trypanosoma vivax</i> during cyclical transmission through antelope . . . . .	163

## PART 2, OCTOBER 1971

IKEME, M. M. Observations on the pathogenicity and pathology of <i>Ascaridia galli</i> . (With 1 Plate) . . . . .	169
LYONS, KATHLEEN M. Comparative electron microscope studies on the epidermis of the blood living juvenile and gill living adult stages of <i>Amphibdella flavolineata</i> (Monogenea) from the electric ray <i>Torpedo nobiliana</i> . (With 4 Plates and 1 Figure in the Text) . . . . .	181
DIXON, J. B. A positive correlation between population size and egg-content in <i>Metastrongylus apri</i> (Gmelin, 1790). (With 3 Figures in the Text) . . . . .	191
STOFFOLANO, J. G., JR., and STREAMS, F. A. Host reactions of <i>Musca domestica</i> , <i>Orthellia caesarion</i> , and <i>Ravinia l'herminieri</i> to the nematode <i>Heterotylenchus autumnalis</i> . (With 5 Plates) . . . . .	195
HARRY, O. G. Studies on infection and reinfection by eugregarines. (With 2 Plates and 3 Figures in the Text) . . . . .	213
WILSON, R. A. Gland cells and secretions in the miracidium of <i>Fasciola hepatica</i> . (With 4 Plates and 1 Figure in the Text) . . . . .	225
IKEME, M. M. Effects of different levels of nutrition and continuing dosing of poultry with <i>Ascaridia galli</i> eggs on the subsequent development of parasite populations . . . . .	233
IKEME, M. M. Weight changes in chickens placed on different levels of nutrition and varying degrees of repeated dosage with <i>Ascaridia galli</i> eggs. (With 4 Figures in the Text) . . . . .	251
EWERS, W. H. <i>Eperythroozoon mariboi</i> sp.nov. (Protophyta: Order Rickettsiales) a parasite of red blood cells of the flying fox <i>Pteropus macrotis epularius</i> in New Guinea. (With 1 Plate and 2 Figures in the Text) . . . . .	261
LEE, D. L. Changes in adult <i>Nippostrongylus brasiliensis</i> during the development of immunity to this nematode in rats. 2. Total lipids and neutral lipids . . . . .	271
LETHBRIDGE, R. C. The chemical composition and some properties of the egg layers in <i>Hymenolepis diminuta</i> eggs. (With 3 Figures in the Text) . . . . .	275
OGBOURNE, C. P. Variations in the fecundity of strongylid worms of the horse. (With 5 Figures in the Text) . . . . .	289
ROSE, M. ELAINE and LONG, P. L. Immunity to coccidiosis: protective effects of transferred serum and cells investigated in chick embryos infected with <i>Eimeria tenella</i> . (With 2 Plates) . . . . .	299

PHILLIPS, R. S. Antigenic variation in <i>Babesia rodhaini</i> demonstrated by immunization with irradiated parasites. (With 4 Figures in the Text) . . . . .	315
KEMP, D. H., KOUDSTAAL, D. and KERR, J. D. Labelling larvae of the cattle-tick <i>Boophilus microplus</i> , with <sup>32</sup> P to follow their movements on the host. (With 2 Figures in the Text) . . . . .	323
SCHLEIN, Y. and THEODOR, O. On the genitalia of the Pupipara and their homologies with those of <i>Calliphora</i> and <i>Glossina</i> . (With 28 Figures in the Text)	331

## PART 3, DECEMBER 1971

CROFTON, H. D. A model of host-parasite relationships. (With 21 Figures in the Text) . . . . .	343
BECKETT, EVELYN B. Histological changes in mosquito flight muscle fibres associated with parasitization by filarial larvae. (With 2 Plates) . . . . .	365
PENNYCUICK, LINDA. Seasonal variations in the parasite infections in a population of three-spined sticklebacks, <i>Gasterosteus aculeatus</i> L. (With 7 Figures in the Text) . . . . .	373
PENNYCUICK, LINDA. Frequency distributions of parasites in a population of three-spined sticklebacks, <i>Gasterosteus aculeatus</i> L., with particular reference to the negative binomial distribution. (With 6 Figures in the Text) . . . . .	389
PENNYCUICK, LINDA. Differences in the parasite infections in three-spined sticklebacks ( <i>Gasterosteus aculeatus</i> L.) of different sex, age and size. (With 8 Figures in the Text) . . . . .	407
SHOTTER, R. A. The biology of <i>Clavella uncinata</i> (Muller) (Crustacea: Copepoda). (With 2 Figures in the Text) . . . . .	419
GUNDERS, A. E. <i>Nuttallia meri</i> sp.nov. - a new piroplasm from <i>Psammomys obesus</i> in the lower Jordan Valley. (With 11 Figures in the Text) . . . . .	431
LEE, D. L. The structure and development of the protozoon <i>Histomonas meleagridis</i> in the male reproductive tract of its intermediate host, <i>Heterakis gallinarum</i> (Nematoda). (With 3 Plates and 2 Figures in the Text) . . . . .	439
YOUNG, A. S. and COX, F. E. G. The effect of betamethasone on <i>Babesia microti</i> and <i>B. rodhaini</i> infections in rodents. (With 4 Figures in the Text) . . . . .	447
OGBOURNE, C. P. On the morphology, growth and identification of the pre-infective larvae of some horse strongylids. (With 7 Figures in the Text) . . . . .	455
KELLER, R. <i>Nippostrongylus brasiliensis</i> in the rat: Failure to relate intestinal histamine and mast cell levels with worm expulsion. (With 1 Figure in the Text) . . . . .	473
READER, T. A. J. The pathological effects of sporocysts, rediae and metacercariae on the digestive gland of <i>Bithynia tentaculata</i> (Mollusca: Gastropoda). (With 2 Plates) . . . . .	483
WILSON, R. A., PULLIN, R. and DENISON, JEAN. An investigation of the mechanism of infection by digenetic trematodes: the penetration of the miracidium of <i>Fasciola hepatica</i> into its snail host <i>Lymnaea truncatula</i> . (With 5 Plates and 1 Figure in the Text) . . . . .	491

	PAGE
MOLOO, S. K. An artificial feeding technique for <i>Glossina</i> . (With 2 Figures in the Text) . . . . .	507
KEARN, G. C. The attachment site, invasion route and larval development of <i>Trochopus pini</i> , a monogenean from the gills of <i>Trigla hirundo</i> . (With 4 Figures in the Text) . . . . .	513