

# Parasitology

## EDITORS

F. E. G. COX *and* C. ARME

## EDITORIAL ASSISTANT

M. ELISABETH PAINTER Ph.D.

## ADVISORY BOARD

L. G. GOODWIN, F.R.S. (Chairman)

R. M. ANDERSON, F.R.S.

J. R. BAKER

D. C. BARKER

J. BARRETT

D. A. P. BUNDY

ELIZABETH U. CANNING

L. H. CHAPPELL\*

D. W. T. CROMPTON

D. I. GIBSON

R. E. HOWELLS

C. R. KENNEDY

A. E. KEYMER

D. L. LEE

D. J. McLAREN

D. P. McMANUS

D. H. MOLYNEUX

D. ROLLINSON

V. R. SOUTHGATE\*

R. C. TINSLEY

K. VICKERMAN, F.R.S.

D. WAKELIN

P. J. WHITFIELD

R. A. WILSON

\* Representing the British Society for Parasitology.



**CAMBRIDGE**  
**UNIVERSITY PRESS**

Published by the Press Syndicate of the University of Cambridge  
The Pitt Building, Trumpington Street, Cambridge CB2 1RP  
40 West 20th Street, New York, NY 10011-4211, USA  
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press, 1993

Printed in Great Britain by the  
University Press Cambridge

# CONTENTS

## PART 1 JANUARY 1993

- DAVIES, C. S., PUDNEY, M., NICHOLAS, J. C. and SINDEN, R. E. The novel hydroxynaphthoquinone 566C80 inhibits the development of liver stages of *Plasmodium berghei* cultured *in vitro* 1
- YANG, D. M. and LIEW, F. Y. Effects of qinghaosu (artemisinin) and its derivatives on experimental cutaneous leishmaniasis 7
- ROBERTSON, L. J., CAMPBELL, A. T. and SMITH, H. V. *In vitro* excystation of *Cryptosporidium parvum* 13
- DIRIE, M. F., OTTE, M. J., THATTHI, R. and GARDINER, P. R. Comparative studies of *Trypanosoma (Duttonella) vivax* isolates from Colombia 21
- TACHEZY, J., KULDA, J. and TOMKOVÁ, E. Aerobic resistance of *Trichomonas vaginalis* to metronidazole induced *in vitro* 31
- SITJA-BOBADILLA, A. and ALVAREZ-PELLITERO, P. Population dynamics of *Sphaerospora dicentrarchi* Sitja-Bobadilla et Alvarez-Pellitero, 1992 and *S. testicularis* Sitja-Bobadilla et Alvarez-Pellitero, 1990 (Myxosporea: Bivalvulida) infections in wild and cultured Mediterranean sea bass (*Dicentrarchus labrax* L.) 39
- MCHARDY, P., RILEY, J. and HUNTLEY, J. F. The recruitment of mast cells, exclusively of the mucosal phenotype, into granulomatous lesions caused by the pentastomid parasite *Porocephalus crotali*: recruitment is irrespective of site 47
- LOISEAU, P. M., GAYRAL, P. and PETEK, F. Purification and properties of phosphoenolpyruvate carboxylase from *Molinema dessetae* (Nematoda: Filarioidea) 55
- MUNN, E. A., SMITH, T. S., GRAHAM, M., GREENWOOD, C. A., TAVERNOR, A. S. and COETZEE, G. Vaccination of merino lambs against haemonchosis with membrane-associated proteins from the adult parasite 63
- TEMBE, E. A., HOLDEN-DYE, L., SMITH, S. W. G., JAQUES, P. A. M. and WALKER, R. J. Pharmacological profile of the 5-hydroxytryptamine receptor of *Fasciola hepatica* body wall muscle 67
- LIU, D., RICKARD, M. D. and LIGHTOWLERS, M. W. Assessment of monoclonal antibodies to *Echinococcus granulosus* Antigen 5 and Antigen B for detection of human hydatid circulating antigens 75
- GUSTAFSSON, M. K. S., NÄSSEL, D. and KUUSISTO, A. Immunocytochemical evidence for the presence of substance P-like peptide in *Diphyllobothrium dendriticum* 83
- GUÉGAN, J-F. and KENNEDY, C. R. Maximum local helminth parasite community richness in British freshwater fish: a test of the colonization time hypothesis 91
- HARTVIGSEN, R. and HALVORSEN, O. Common and rare trout parasites in a small landscape system 101

## PART 2 FEBRUARY 1993

- EKONG, R. M., ROBSON, K. J. H., BAKER, D. A. and WARHURST, D. C. Transcripts of the multidrug resistance genes in chloroquine-sensitive and chloroquine-resistant *Plasmodium falciparum* 107
- WALES, A., FUKUMOTO, S.-I., OTIENO, M. F. and KUSEL, J. R. Effects of irradiation on surface carbohydrates of larvae of *Schistosoma mansoni* 117
- HARRIS, R. A., PRESTON, T. M. and SOUTHGATE, V. R. Purification of an agglutinin from the haemolymph of the snail *Bulinus nasutus* and demonstration of related proteins in other *Bulinus* spp. 127
- TRUC, P. and TIBAYRENC, M. Population genetics of *Trypanosoma brucei* in Central Africa: taxonomic and epidemiological significance 137

MAJIWA, P. A. O., MAINA, M., WAITUMBI, J. N., MIHOK, S. and ZWEYGARTH, E. <i>Trypanosoma (Nannomonas) congolense</i> : molecular characterization of a new genotype from Tsavo, Kenya	151
HAWDON, J. M., VOLK, S. W., ROSE, R., PRITCHARD, D. I., BEHNKE, J. M. and SCHAD, G. A. Observations on the feeding behaviour of parasitic third-stage hookworm larvae	163
BRENNAN, G. P., HALTON, D. W., MAULE, A. G., SHAW, C., JOHNSTON, C. F., MOORE, S. and FAIRWEATHER, I. Immunoelectron microscopical studies of regulatory peptides in the nervous system of the monogenean parasite, <i>Diclidophora merlangi</i>	171
YAEGASHI, H., HOWARD, C. V., MCKERR, G. and BURNS, A. Stereological estimation of the total number of neurons in the asexually dividing tetrathyridium of <i>Mesocestoides corti</i>	177
BATRA, S., SRIVASTAVA, J. K., GUPTA, S., KATIYAR, J. C. and SRIVASTAVA, V. M. L. Role of reactive oxygen species in expulsion of <i>Nippostrongylus brasiliensis</i> from rats	185
BRETAGNE, S., GUILLOU, J. P., MORAND, M. and HOUIN, R. Detection of <i>Echinococcus</i> <i>multilocularis</i> DNA in fox faeces using DNA amplification	193
PAPPAS, P. W. and DURKA, G. M. A study of carbohydrate metabolism in the eggs (oncospheres) of the tapeworm, <i>Hymenolepis diminuta</i> , with special reference to glucose	201
MEDLEY, G. F., GUYATT, H. L. and BUNDY, D. A. P. A quantitative framework for evaluating the effect of community treatment on the morbidity due to ascariasis	211

### PART 3 APRIL 1993

READ, M., SHERWIN, T., HOLLOWAY, S. P., GULL, K. and HYDE, J. E. Microtubular organization visualized by immunofluorescence microscopy during erythrocytic schizogony in <i>Plasmodium falciparum</i> and investigation of post-translational modifications of parasite tubulin	223
SEOW, F., KATELARIS, P. and NGU, M. The effect of <i>Giardia lamblia</i> trophozoites on trypsin, chymotrypsin and amylase <i>in vitro</i>	233
CONRAD, P. A., BARR, B. C., SVERLOW, K. W., ANDERSON, M., DAFT, B., KINDE, H., DUBEY, J. P., MUNSON, L. and ARDANS, A. <i>In vitro</i> isolation and characterization of a <i>Neospora</i> sp. from aborted bovine fetuses	239
MEDLEY, G. F., PERRY, B. D. and YOUNG, A. S. Preliminary analysis of the transmission dynamics of <i>Theileria parva</i> in eastern Africa	251
CHIPEV, N. H. Decoy effect and host infection by miracidia within snail communities	265
MOLOO, S. K., GETTINBY, G., OLUBAYO, R. O., KABATA, J. M. and OKUMU, I. O. A comparison of African Buffalo, N'Dama and Boran cattle as reservoirs of <i>Trypanosoma vivax</i> for different <i>Glossina</i> species	277
SAOWAKONTHA, S., PIPITGOOL, V., PARIYANONDA, S., TESANA, S., ROJSATHAPORN, K. and INTARAKHAO, C. Field trials in the control of <i>Opisthorchis viverrini</i> with an integrated programme in endemic areas of northeast Thailand	283
KALINNA, B. and McMANUS, D. P. An IgG (Fcγ)-binding protein of <i>Taenia crassiceps</i> (Cestoda) exhibits sequence homology and antigenic similarity with schistosome paramyosin	289
FUJINO, T., FRIED, B. and TADA, I. The expulsion of <i>Echinostoma trivolvis</i> : worm kinetics and intestinal cytopathology in conventional and congenitally athymic BALB/c mice	297
BROWNLEE, D. J. A., FAIRWEATHER, I., JOHNSTON, C. F., SMART, D., SHAW, C. and HALTON, D. W. Immunocytochemical demonstration of neuropeptides in the central nervous system of the roundworm, <i>Ascaris suum</i> (Nematoda: Ascaroidea)	305
PAPPAS, P. W. and DURKA, G. M. Temporal changes in glucose and carbohydrate metabolism in the oncospheres of the cyclophyllidean tapeworm, <i>Hymenolepis</i> <i>diminuta</i>	317
BALBUENA, J. A. and RAGA, J. A. Intestinal helminth communities of the long-finned pilot whale ( <i>Globicephala melas</i> ) off the Faroe Islands	327

PART 4 MAY 1993

- CHENG, Q., STOWERS, A., HUANG, T.-Y., BUSTOS, D., HUANG, Y.-M., RZEPczyk, C. AND SAUL, A. Polymorphism in *Plasmodium vivax* MSA1 gene – the result of intragenic recombinations? 335
- EY, P. L., ANDREWS, R. H. AND MAYRHOFER, G. Differentiation of major genotypes of *Giardia intestinalis* by polymerase chain reaction analysis of a gene encoding a trophozoite surface antigen 347
- BAYLIS, M. AND NAMBIRO, C. O. The effect of cattle infection by *Trypanosoma congolense* on the attraction, and feeding success, of the tsetse fly *Glossina pallidipes* 357
- BRADLEY, J. E., GILLESPIE, A. J., TRENHOLME, K. R. AND KARAM, M. The effects of vector control on the antibody response to antigens of *Onchocerca volvulus* 363
- GOYAL, P. K. AND WAKELIN, D. Influence of variation in host strain and parasite isolate on inflammatory and antibody responses to *Trichinella spiralis* in mice 371
- QUINNELL, R. J., SLATER, A. F. G., TIGHE, P., WALSH, E. A., KEYMER, A. E. AND PRITCHARD, D. I. Reinfection with hookworm after chemotherapy in Papua New Guinea 379
- MOULIA, C., LE BRUN, N., DALLAS, J., ORTH, A. AND RENAUD, F. Experimental evidence of genetic determinism in high susceptibility to intestinal pinworm infection in mice: a hybrid zone model 387
- KNOX, D. P., REDMOND, D. L. AND JONES, D. G. Characterization of proteinases in extracts of adult *Haemonchus contortus*, the ovine abomasal nematode 395
- STEWART, G. R., PERRY, R. N., ALEXANDER, J. AND WRIGHT, D. J. A glycoprotein specific to the amphids of *Meloidogyne* species 405
- THEODORE, J. G., KALIRAJ, P., JAYACHANDRAN, S. AND JAYARAMAN, K. Cloning, over-expression and evaluation of a recombinant fusion protein of *Wuchereria bancrofti* towards its application as a diagnostic agent for bancroftian filariasis 413
- PARRI, H. R., DJAMGOZ, M. B. A., HOLDEN DYE, L. AND WALKER, R. J. An ion-sensitive microelectrode study on the effect of a high concentration of ivermectin on chloride balance in the somatic muscle bag cells of *Ascaris suum* 421
- MAULE, A. G., HALTON, D. W., SHAW, C. AND JOHNSTON, C. F. The cholinergic, serotonergic and peptidergic components of the nervous system of *Moniezia expansa* (Cestoda, Cyclophyllidea) 429

PART 5 JUNE 1993

- MEDLEY, G. F., SINDEN, R. E., FLECK, S., BILLINGSLEY, P. F., TIRAWANCHAI, N. AND RODRIGUEZ, M. H. Heterogeneity in patterns of malarial oocyst infections in the mosquito vector 441
- LOCKYER, M. J., COOPER, H., TITE, J., ROWAN, W. AND CROWE, J. S. Immunogenicity of a hybrid *Plasmodium falciparum* malaria antigen 451
- SHI, Y.-E., JIANG, C.-F., HAN, J.-J., LI, Y.-L. AND RUPPEL, A. Immunization of pigs against infection with *Schistosoma japonicum* using ultraviolet-attenuated cercariae 459
- LAWSON, B. W. L., BICKLE, Q. D. AND TAYLOR, M. G. Mechanism involved in the loss of antibody-mediated adherence of macrophages to lung-stage schistosomula of *Schistosoma mansoni* in vitro 463
- DAY, T. A., ORR, N., BENNETT, J. L. AND PAX, R. A. Voltage-gated currents in muscle cells of *Schistosoma mansoni* 471
- WOOLHOUSE, M. E. J., HARGROVE, J. W. AND MCNAMARA, J. J. Epidemiology of trypanosome infections of the tsetse fly *Glossina pallidipes* in the Zambezi Valley 479
- MCGINTY, A., MOORE, M., HALTON, D. W. AND WALKER, B. Characterization of the cysteine proteinases of the common liver fluke *Fasciola hepatica* using novel, active-site directed affinity labels 487

LEADABRAND, C. C. AND NICKOL, B. B. Establishment, survival, site selection and development of <i>Leptorhynchoides thecatus</i> in largemouth bass, <i>Micropterus salmoides</i>	495
NIE, P. AND KENNEDY, C. R. Infection dynamics of larval <i>Bothriocephalus claviceps</i> in <i>Cyclops vicinus</i>	503
ROGAN, M. T., MARSHALL, I., REID, G. D. F., MACPHERSON, C. N. L. AND CRAIG, P. S. The potential of vervet monkeys ( <i>Cercopithecus aethiops</i> ) and baboons ( <i>Papio anubis</i> ) as models for the study of the immunology of <i>Echinococcus granulosus</i> infections	511
HOLMES, J. AND BARTOLI, P. Spatio-temporal structure of the communities of helminths in the digestive tract of <i>Sciaena umbra</i> L. 1758 (Teleostei)	519
SHOSTAK, A. W. AND SCOTT, M. E. Detection of density-dependent growth and fecundity of helminths in natural infections	527

## Parasitology

**Back volumes.** Vols. 1-71: Inquiries should be addressed to Wm. Dawson & Sons Ltd, Cannon House, Folkestone, Kent. Vols. 72 onwards: quotations for parts still in print may be obtained from Cambridge or the American Branch of Cambridge University Press.

**Copying.** This journal is registered with the Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970. Organizations in the USA who are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. of the per-copy fee of \$5.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0031-1820/93 \$5.00 + .00.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions.

**ISI Tear Sheet Service.** 3051 Market Street, Philadelphia, Pennsylvania 19104, USA, is authorized to supply single copies of separate articles for private use only.

**For all other use,** permission should be sought from Cambridge or the American Branch of Cambridge University Press.

**Claims** for missing issues can only be considered if made immediately after receipt of the subsequent issue.

**Advertising.** Details of advertising in *Parasitology* may be obtained from the publisher.

© Cambridge University Press 1993

The Pitt Building, Trumpington Street, Cambridge CB2 1RP  
40 West 20th Street, New York, NY 10011-4211, USA  
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

*Printed in Great Britain by the University Press, Cambridge*

# Parasitology

## CONTENTS

	PAGE
Medley, G. F., Sinden, R. E., Fleck, S., Billingsley, P. F., Tirawanchai, N. and Rodríguez, M. H. Heterogeneity in patterns of malarial oocyst infections in the mosquito vector	441
Lockyer, M. J., Cooper, H., Tite, J., Rowan, W. and Crowe, J. S. Immunogenicity of a hybrid <i>Plasmodium falciparum</i> malaria antigen	451
Shi, Y.-E., Jiang, C.-F., Han, J.-J., Li, Y.-L. and Ruppel, A. Immunization of pigs against infection with <i>Schistosoma japonicum</i> using ultraviolet-attenuated cercariae	459
Lawson, B. W. L., Bickle, Q. D. and Taylor, M. G. Mechanisms involved in the loss of antibody-mediated adherence of macrophages to lung-stage schistosomula of <i>Schistosoma mansoni</i> <i>in vitro</i>	463
Day, T. A., Orr, N., Bennett, J. L. and Pax, R. A. Voltage-gated currents in muscle cells of <i>Schistosoma mansoni</i>	471
Woolhouse, M. E. J., Hargrove, J. W. and McNamara, J. J. Epidemiology of trypanosome infections of the tsetse fly <i>Glossina pallidipes</i> in the Zambezi Valley	479
McGinty, A., Moore, M., Halton, D. W. and Walker, B. Characterization of the cysteine proteinases of the common liver fluke <i>Fasciola hepatica</i> using novel, active-site directed affinity labels	487
Leadabrand, C. C. and Nickol, B. B. Establishment, survival, site selection and development of <i>Leptorhynchoides thecatus</i> in largemouth bass, <i>Micropterus salmoides</i>	495
Nie, P. and Kennedy, C. R. Infection dynamics of larval <i>Bothriocephalus claviceps</i> in <i>Cyclops vicinus</i>	503
Rogan, M. T., Marshall, I., Reid, G. D. F., Macpherson, C. N. L. and Craig, P. S. The potential of vervet monkeys ( <i>Cercopithecus aethiops</i> ) and baboons ( <i>Papio anubis</i> ) as models for the study of the immunology of <i>Echinococcus granulosus</i> infections	511
Holmes, J. and Bartoli, P. Spatio-temporal structure of the communities of helminths in the digestive tract of <i>Sciaena umbra</i> L. 1758 (Teleostei)	519
Shostak, A. W. and Scott, M. E. Detection of density-dependent growth and fecundity of helminths in natural infections	527

