

# 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.

R. W. ASHFORD

D. C. BARKER

D. A. P. BUNDY

A. O. BUSH

L. H. CHAPPELL\*

D. W. T. CROMPTON

K. DIETZ

H. GINSBURG

D. W. HALTON

C. R. KENNEDY

M. W. KENNEDY

D. L. LEE

D. P. McMANUS

P. W. PAPPAS

R. A. PAX

D. ROLLINSON

A. SAUL

M. E. SCOTT

A. SHER

R. C. TINSLEY

K. VICKERMAN, F.R.S.

D. WAKELIN

P. J. WHITFIELD

R. A. WILSON

M. E. J. WOOLHOUSE

\* 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, United Kingdom

CAMBRIDGE UNIVERSITY PRESS  
The Edinburgh Building, Cambridge CB2 2RU, United Kingdom  
40 West 20th Street, New York, NY 10011-4211, USA  
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press, 1996

Printed in Great Britain by the  
University Press Cambridge

# CONTENTS

## PART 1 JULY 1996

- LARSEN, M., NANSEN, P., GRØNDAHL, C., THAMSBORG, S. M., GRØNVOLD, J.,  
WOLSTRUP, J., HENRIKSEN, S. A. and MONRAD, J. The capacity of the fungus  
*Duddingtonia flagrans* to prevent strongyle infections in foals on pasture 1
- GINSBURG, H., ATAMNA, H., SHALMIEV, G., KANAANI, J. and KRUGLIAK, M. Resistance  
of glucose-6-phosphate dehydrogenase deficiency to malaria: effects of fava bean  
hydroxypyrimidine glucosides on *Plasmodium falciparum* growth in culture and on the  
phagocytosis of infected cells 7
- ASAHI, H., KANAZAWA, T., KAJIHARA, Y., TAKAHASHI, K. and TAKAHASHI, T.  
Hypoxanthine: a low molecular weight factor essential for growth of erythrocytic  
*Plasmodium falciparum* in a serum-free medium 19
- HETZEL, C. and ANDERSON, R. M. The within-host cellular dynamics of bloodstage  
malaria: theoretical and experimental studies 25
- FRANCO, A. M. R., MOMEN, H., NAIFF, R. D., MOREIRA, C. F. S., DEANE, M. P. and  
GRIMALDI, G. JR. Enzyme polymorphism in *Endotrypanum* and numerical analysis of  
isoenzyme data 39
- FLEGR, J., ZITKOVÁ, Š., KODYM, P. and FRYNTA, D. Induction of changes in human  
behaviour by the parasitic protozoan *Toxoplasma gondii* 49
- DAY, T. A., CHEN, G-Z., MILLER, C., TIAN, M., BENNETT, J. L. and PAX, R. A. Cholinergic  
inhibition of muscle fibres isolated from *Schistosoma mansoni* (Trematoda: Digenea) 55
- GRAAF, D. C. DE, BERGHEN, P., MOENS, L., MAREZ, T. M. DE, RAES, S., BLAXTER, M. L.  
and VERCRUYSSSE, J. Isolation, characterization and immunolocalization of a globin-  
like antigen from *Ostertagia ostertagi* adults 63
- STROTE, G., BONOW, I. and ATTAH, S. The ultrastructure of the anterior end of male  
*Onchocerca volvulus*: papillae, amphids, nerve ring and first indication of an excretory  
system in the adult filarial worm 71
- HOLLAND, C. V., ASAOLU, S. O., CROMPTON, D. W. T., WHITEHEAD, R. R. and  
COOMBS, I. Targeted anthelmintic treatment of school children: effect of frequency  
of application on the intensity of *Ascaris lumbricoides* infection in children from rural  
Nigerian villages 87

## PART 2 AUGUST 1996

- LEFCORT, H. and DURDEN, L. A. The effect of infection with Lyme disease spirochetes  
(*Borrelia burgdorferi*) on the phototaxis, activity, and questing height of the tick vector  
*Ixodes scapularis* 97
- KOELLA, J. C. and PACKER, M. J. Malaria parasites enhance blood-feeding of their  
naturally infected vector *Anopheles punctulatus* 105
- WEN, H., NEW, R. R. C., MUHMUT, M., WANG, J. H., WANG, Y. H., ZHANG, J. H., SHAO,  
Y. M. and CRAIG, P. S. Pharmacology and efficacy of liposome-entrapped albendazole  
in experimental secondary alveolar echinococcosis and effect of co-administration with  
cimetidine 111
- BUMANN, D. and PULS, G. Infestation with larvae of the sea anemone *Edwardsia lineata*  
affects nutrition and growth of the ctenophore *Mnemiopsis leidyi* 123
- TCHUEM TCHUENTÉ, L.-A., MORAND, S., IMBERT-ESTABLET, D., DELAY, B. and  
JOURDANE, J. Competitive exclusion in human schistosomes: the restricted  
distribution of *Schistosoma intercalatum* 129
- REDMAN, C. A. and KUSEL, J. R. Distribution and biophysical properties of fluorescent  
lipids on the surface of adult *Schistosoma mansoni* 137

BISOFFI, M. and BETSCHART, B. Identification and sequence comparison of a cuticular collagen of <i>Brugia pahangi</i>	145
AUSTIN, D. J. and ANDERSON, R. M. Immunodominance, competition and evolution in immunological responses to helminth parasite antigens	157
MASSON, S. D., MCKAY, D. M., STEAD, R. H., AGRO, A., STANISZ, A. and PERDUE, M. H. <i>Nippostrongylus brasiliensis</i> infection evokes neuronal abnormalities and alterations in neurally regulated electrolyte transport in rat jejunum	173
STUART, R. J., LEWIS, E. E. and GAUGLER, R. Selection alters the pattern of emergence from the host cadaver in the entomopathogenic nematode, <i>Steinernema glaseri</i>	183
ROBERTSON, A. P. and MARTIN, R. J. Effects of pH on a high conductance Ca-dependent chloride channel: a patch-clamp study in <i>Ascaris suum</i>	191
LAMPO, M. and BAYLISS, P. The impact of ticks on <i>Bufo marinus</i> from native habitats	199

### PART 3 SEPTEMBER 1996

DUPAS, S., BREHELIN, M., FREY, F. and CARTON, Y. Immune suppressive virus-like particles in a <i>Drosophila</i> parasitoid: significance of their intraspecific morphological variations	207
JONES, M. K., ZHANG, L.-H., LEGGATT, G. R., STENZEL, D. J. and McMANUS, D. P. The ultrastructural localization of <i>Echinococcus granulosus</i> antigen 5	213
FULFORD, A. J. C., OUMA, J. H., KARIUKI, H. C., THIONGO, F. W., KLUMPP, R., KLOOS, H., STURROCK, R. F. and BUTTERWORTH, A. E. Water contact observations in Kenyan communities endemic for schistosomiasis: methodology and patterns of behaviour	223
OCHANDA, H., YOUNG, A. S., WELLS, C., MEDLEY, G. F. and PERRY, B. D. Comparison of the transmission of <i>Theileria parva</i> between different instars of <i>Rhipicephalus appendiculatus</i>	243
YOUNG, A. S., DOLAN, T. T., MORZARIA, S. P., MWAKIMA, F. N., NORVAL, R. A. I., SCOTT, J., SHERRIFF, A. and GETTINBY, G. Factors influencing infections in <i>Rhipicephalus appendiculatus</i> ticks fed on cattle infected with <i>Theileria parva</i>	255
SHAW, M. K. Characterization of the parasite-host cell interactions involved in <i>Theileria parva</i> sporozoite invasion of bovine lymphocytes	267
KIRK, R. S. and LEWIS, J. W. Migration and development of the blood fluke <i>Sanguinicola inermis</i> Plehn, 1905 (Trematoda: Sanguinicolidae) in carp, <i>Cyprinus carpio</i> L.	279
FOSTER, N. and LEE, D. L. Vasoactive intestinal polypeptide-like and peptide histidine isoleucine-like proteins excreted/secreted by <i>Nippostrongylus brasiliensis</i> , <i>Nematodirus battus</i> and <i>Ascaridia galli</i>	287
KENNEDY, C. R. and GUÉGAN, J.-F. The number of niches in intestinal helminth communities of <i>Anguilla anguilla</i> : are there enough spaces for parasites?	293
ASHWORTH, S. T., KENNEDY, C. R. and BLANC, G. Density-dependent effects of <i>Anguillicola crassus</i> (Nematoda) within and on its copepod intermediate hosts	303
BANSEMIR, A. D. and SUKHDEO, M. V. K. Villus length influences habitat selection by <i>Heligmosomoides polygyrus</i>	311

### PART 4 OCTOBER 1996

CRANDALL, I., DEMERS, D. and SHERMAN, I. W. The effect of proteases and iodination on the adherent behaviour of <i>Plasmodium falciparum</i> -infected erythrocytes	317
MUKHOPADHYAY, S., DASH, A. P. and RAVINDRAN, B. <i>Setaria digitata</i> microfilaraemia in <i>Mastomys coucha</i> : an animal model for chemotherapeutic and immunobiological studies	323

BASÁÑEZ, M. G., TOWNSON, H., WILLIAMS, J. R., FRONTADO, H., VILLAMIZAR, N. J. and ANDERSON, R. M. Density-dependent processes in the transmission of human onchocerciasis: relationship between microfilarial intake and mortality in the simuliid vector	331
RUPP, J. C. Parasite-altered behaviour: impact of infection and starvation on mating in <i>Biomphalaria glabrata</i>	357
JOHANSEN, M. V., FILLIÉ, Y., MONRAD, J., CHRISTENSEN, N. Ø. and DEELDER, A. Experimental <i>Schistosoma bovis</i> infection in goats. Circulating antigen and antibody responses to egg and adult worm antigens during infection and following treatment with praziquantel	367
LIU, J. L., FONTAINE, J., CAPRON, A. and GRZYCH, J. M. Ultrastructural localization of Sm28 GST protective antigen in <i>Schistosoma mansoni</i> adult worms	377
MARKS, N. J., JOHNSON, S., MAULE, A. G., HALTON, D. W., SHAW, C., GEARY, T. G., MOORE, S. and THOMPSON, D. P. Physiological effects of plathyhelminth RFamide peptides on muscle-strip preparations of <i>Fasciola hepatica</i> (Trematoda: Digenea)	393
GUTIÉRREZ-PEÑA, E. J., KNAB, J. and BÜTTNER, D. W. Neutrophil granule proteins: evidence for the participation in the host reaction to skin microfilariae of <i>Onchocerca volvulus</i> after diethylcarbamazine administration	403
LILLEY, C. J., URWIN, P. E., MCPHERSON, M. J. and ATKINSON, H. J. Characterization of intestinally active proteinases of cyst-nematodes	415

#### PART 5 NOVEMBER 1996

HAJI, H., SMITH, T., CHARLWOOD, J. D. and MEUWISSEN, J. H. Absence of relationships between selected human factors and natural infectivity of <i>Plasmodium falciparum</i> to mosquitoes in an area of high transmission	425
OPPLIGER, A., CELÉRIÉR, M. L. and CLOBERT, J. Physiological and behaviour changes in common lizards parasitized by haemogregarines	433
DUNN, P. P. J., BUMSTEAD, J. M. and TOMLEY, F. M. Sequence, expression and localization of calmodulin-domain protein kinases in <i>Eimeria tenella</i> and <i>Eimeria maxima</i>	439
ADAMSON, R. E. and HALL, F. R. Matrix metalloproteinases mediate the metastatic phenotype of <i>Theileria annulata</i> -transformed cells	449
SERRA, E., LIU, J.-L., CAPRON, A., ZEMZOUMI, K. and DISSOUS, C. Expression of NF- $\kappa$ B nuclear factor in <i>Schistosoma mansoni</i>	457
DE BONT, J., VAN LIESHOUT, L., DEELDER, A. M., YSEBAERT, M. T. and VERCRUYSSSE, J. Circulating antigen levels in serum of cattle naturally infected with <i>Schistosoma mattheei</i>	465
CAMPBELL, J. F., LEWIS, E., YODER, F. and GAUGLER, R. Entomopathogenic nematode (Heterorhabditidae and Steinernematidae) spatial distribution in turfgrass	473
GRENIER, E., BONIFASSI, E., ABAD, P. and LAUMOND, C. Use of species-specific satellite DNAs as diagnostic probes in the identification of Steinernematidae and Heterorhabditidae entomopathogenic nematodes	483
WINTER, M. D., WRIGHT, C., WAKELIN, D. and LEE, D. L. The serum immune response of young lambs to a primary infection with <i>Nematodirus battus</i>	491
HADJU, V., STEPHENSON, L. S., ABADI, K., MOHAMMED, H. O., BOWMAN, D. D. and PARKER, R. S. Improvements in appetite and growth in helminth-infected schoolboys three and seven weeks after a single dose of pyrantel pamoate	497

#### PART 6 DECEMBER 1996

LOPEZ-BERNAD, F., DEL CACHO, E., GALLEGU, M., QUILEZ, J. and SANCHEZ-ACEDO, C. Identification of a fibronectin-like molecule on <i>Eimeria tenella</i>	505
--	-----

BARRAL, V., MORAND, S., POINTIER, J. P. and THÉRON, A. Distribution of schistosome genetic diversity within naturally infected <i>Rattus rattus</i> detected by RAPD markers	511
PIERROT, C., GODIN, C., LIU, J. L., CAPRON, A. and KHALIFE, J. <i>Schistosoma mansoni</i> elastase: an immune target regulated during the parasite life-cycle	519
POZIO, E., LA ROSA, G., SERRANO, F. J., BARRAT, J. and ROSSI, L. Environmental and human influence on the ecology of <i>Trichinella spiralis</i> and <i>Trichinella britovi</i> in Western Europe	527
HARWOOD, C. L., YOUNG, I. S., LEE, D. L. and ALTRINGHAM, J. D. The effect of <i>Trichinella spiralis</i> infection on the mechanical properties of the mammalian diaphragm	535
PENG WEIDONG, ZHOU XIANMIN, CUI XIAOMIN, CROMPTON, D. W. T., WHITEHEAD, R. R., XIONG JIANGQIN, WU HAIGENG, PENG JIYUAN, YANG YANG, WU WEIXING, XU KAIWU and YAN YONGXING. <i>Ascaris</i> , people and pigs in a rural community of Jiangxi Province, China	545
GUSTAFSSON, M. K. S., LINDHOLM, A. M., TERENINA, N. B. and REUTER, M. NO nerves in a tapeworm. NADPH-diaphorase histochemistry in adult <i>Hymenolepis diminuta</i>	559
FAVIA, G., LANFRANCOTTI, A., DELLA TORRE, A., CANCRINI, G. and COLUZZI, M. Polymerase chain reaction–identification of <i>Dirofilaria repens</i> and <i>Dirofilaria immitis</i>	567
LEWIS, E. E., RICCI, M. and GAUGLER, R. Host recognition behaviour predicts host suitability in the entomopathogenic nematode <i>Steinernema carpocapsae</i> (Rhabditida: Steinernematidae)	573
JONES, J. T., CURTIS, R. H., WIGHTMAN, P. J. and BURROWS, P. R. Isolation and characterization of a putative collagen gene from the potato cyst nematode <i>Globodera pallida</i>	581
CURTIS, R. H. C. Identification and <i>in situ</i> and <i>in vitro</i> characterization of secreted proteins produced by plant-parasitic nematodes	589

# Health & Medical Information

## CD-ROM

ONE STOP MAIL ORDER SERVICE  
for Health & Medical CD-ROMs

CD-ROM has quickly become a major vehicle for the transfer of medical knowledge with new titles being published every week. Healthworks can now provide you with a one-stop mail order service for medical CD-ROMs and other electronic publications.

The CD-ROM catalogue covers such subject areas as:

***AIDS, Allergies, Anatomy, Anaesthesia, Dermatology, Gastroenterology, Genetics, Haematology, Health & Safety, Imaging, Immunology, Infectious Diseases, Nephrology, Neurology, Nursing, Obstetrics, Oncology, Ophthalmology, Pathology, Pharmacology, Paediatrics, Radiology, Rheumatology, Surgery and many more.***

For your free copy of the Healthworks CD-ROM catalogue for both IBM PC compatibles and Apple Macintosh computers. contact us now on:

Tel: 0113 243 9899 Fax: 0113 247782

E-mail: sales@d-access.demon.co.uk

## Healthworks

FOR FURTHER INFORMATION  
ABOUT HEALTHWORKS MEDICAL  
INFORMATION SERVICES & PRODUCTS  
LOOK AT OUR INTERNET SITE AT:

<http://www.healthworks.co.uk>

## HEALTH ON THE INTERNET

The Internet carries huge amounts of health related information but how do you find exactly what you want? **Health on the Internet** is a new publication that helps to solve some of the many problems encountered in locating health and medical information on the Internet. **Health on the Internet** is essential reading for medical professionals who are interested in utilising this powerful new medium for communication, research, or simply keeping up-to-date with the latest developments. Each issue includes details of:

*sources of health news, medical software and images, new world wide web, ftp and gopher sites, newsgroups and mailing lists, health publications and businesses on the Internet. Plus, each issue also covers a particular area of medicine in depth.*

**Health on the Internet** is published monthly in two formats:

1. In HTML format e-mailed directly to your desktop computer, with clickable hypertext links to the referenced resources.
2. The printed version, complete with 'hotlist' of all the referenced resources.

To see a sample copy of the newsletter visit the Healthworks Internet site at:

<http://www.healthworks.co.uk>

The E-mail version costs £26/\$45 worldwide.

The Print version costs: UK & EC member countries - £36/\$54. Rest of World - £60/\$90

Please make cheques/money orders payable to "Healthworks Limited" and send to:

Healthworks, (Dept. CUP1)

30-38 Dock Street, Leeds LS10 1JF, England

Leading the way in the study of all aspects of  
infection of man and animals ...

# Epidemiology and Infection

## Aims and Scope

**Epidemiology and Infection** presents reports of research and original findings in all subjects related to infectious diseases. It gives particular emphasis to the epidemiology, prevention and control of such diseases, but the field covered is broad and includes microbiology, virology, immunology, sanitary bacteriology, food hygiene, statistics and the clinical, diagnostic and social aspects of infectious diseases. Papers cover both the medical and veterinary field and come from scientists worldwide.

## Editorial Policy

**Epidemiology and Infection** started life as the 'Journal of Hygiene' and is now the longest established journal in the field of microbiology. **Epidemiology and Infection** has contained many important and seminal papers on such topics as scarlet fever, typhoid, pathogenic microbes in milk, bacteriological examination of water and the like.

It is still the home for important papers on these topics but also has become the key periodical in which to find the latest reports on recently discovered infections and new technology. In the new title, used since 1987, the word 'Infection' reflects the broadly based nature of the journal and 'Epidemiology' the particular slant of the journal since it was founded. The editors' overriding policy is to publish high quality articles in the shortest possible time (some articles are published in as little as 4 months). The success of this policy is shown by the very high submission rate from authors and the journal's high impact factor and long cited half life (SCI Journal Citation Report).

## Why You Should Subscribe

- high-quality articles
- international coverage
- rapid publication
- regular review articles
- covers wide subject area
- book reviews
- high quality & accurate production
- colour illustrations where this enhances understanding
- no page charges and free offprints for authors
- wide audience

## Subscription Information

Six issues a year in 2 volumes. Volumes 116 & 117 in 1996. £190; £97 for members of the Society for Infectious Diseases and British Society for the Study of Infection. Airmail £36 per year extra. ISSN 0950-2688.

### Take a closer look - FREE!

- Please send me a free sample copy of **Epidemiology and Infection**
- Please send me further information

Name \_\_\_\_\_

Address \_\_\_\_\_

Send this coupon to: Journals Marketing Department,  
Cambridge University Press, FREEPOST\*, The  
Edinburgh Building, Cambridge CB2 1BR, UK  
Tel: +44 (0)1223 325806 Fax: +44 (0)1223 315052  
(\*no postage stamp necessary if posted in the UK)

In USA, Canada & Mexico, write to: Cambridge  
University Press, 40 West 20th Street, New York,  
NY 10011-4211, USA



**CAMBRIDGE**  
UNIVERSITY PRESS



## Leading medical journals...

- **Annals of Human Genetics**
- **The British Journal of Nutrition**
- **Cambridge Quarterly of Healthcare Ethics**
- **Developmental Medicine and Child Neurology**
- **Epidemiology and Infection**
- **Experimental Physiology**
- **Fetal & Maternal Medicine Review**
- **Genetical Research**
- **International Journal of Technology Assessment in Healthcare**
- **Journal of Anatomy**
- **Journal of Physiology**
- **The Proceedings of the Nutrition Society**
- **Protein Science**
- **Psychological Medicine**
- **Quarterly Reviews of Biophysics**
- **RNA**
- **Visual Neuroscience**
- **Zygote**

For well over a hundred years Cambridge University Press has been publishing internationally renowned research periodicals in the field of medicine and health-care which have established themselves at the cutting edge of scientific research.

### Coverage

They have a wide subject area coverage, from the long established and internationally respected *Journal of Physiology* and *Journal of Anatomy* to the newly developing areas of ethics, health economics and technology assessment covered by *Cambridge Quarterly of Healthcare Ethics* and *International Journal of Technology Assessment in Healthcare*.

### Features

- Fast publication times
- Extensive book review sections
- Occasional special issues and supplements in topical areas
- No page charges for authors
- Very high quality scientific papers
- Peer-review
- Highest editorial and production standards
- Outstanding indexing services
- Abstracted and indexed by leading bodies
- colour illustration where required
- high impact factors and cited half-lives

*Illustration taken from P. R. Stanfield, N. W. Davies, P. A. Shelton, M. J. Sutcliffe, I. A. Khan, W. J. Brammar and E. C. Conley, A single aspartate residue is involved in both intrinsic gating and blockage by Mg<sup>2+</sup> or the inward rectifier, IRK1, Journal of Physiology, Vol 478, p5.*

### Further information

Please send me more information about \_\_\_\_\_

Please send the most recent medical books catalogue

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Send to: Journals Marketing Department, Cambridge University Press, FREEPOST\*, The Edinburgh Building, Cambridge, CB2 1BR, UK.  
Tel: +44 (0)1223 325806  
Fax: +44 (0)1223 315052  
Email: journals\_marketing@cup.cam.ac.uk

In North America write to: Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211, USA



**CAMBRIDGE UNIVERSITY PRESS**  
pharm94

## 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, 222 Rosewood Drive, Danvers, MA 01923. 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 \$11.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0031–1820/96 \$11.00 + .10.

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 1996

The Edinburgh Building, Cambridge CB2 2RU, United Kingdom  
40 West 20th Street, New York, NY 10011–4211, USA  
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

*Printed in the United Kingdom by the University Press, Cambridge*



# Parasitology

## CONTENTS

	PAGE
Lopez-Bernad, F., Del Cacho, E., Gallego, M., Quilez, J. and Sanchez-Acedo, C. Identification of a fibronectin-like molecule on <i>Eimeria tenella</i>	505
Barral, V., Morand, S., Pointier, J. P. and Théron, A. Distribution of schistosome genetic diversity within naturally infected <i>Rattus rattus</i> detected by RAPD markers	511
Pierrot, C., Godin, C., Liu, J. L., Capron, A. and Khalife, J. <i>Schistosoma mansoni</i> elastase: an immune target regulated during the parasite life-cycle	519
Pozio, E., La Rosa, G., Serrano, F. J., Barrat, J. and Rossi, L. Environmental and human influence on the ecology of <i>Trichinella spiralis</i> and <i>Trichinella britovi</i> in Western Europe	527
Harwood, C. L., Young, I. S., Lee, D. L. and Altringham, J. D. The effect of <i>Trichinella spiralis</i> infection on the mechanical properties of the mammalian diaphragm	535
Peng Weidong, Zhou Xianmin, Cui Xiaomin, Crompton, D. W. T., Whitehead, R. R., Xiong Jiangqin, Wu Haigeng, Peng Jiyuan, Yang Yang, Wu Weixing, Xu Kaiwu and Yan Yongxing. <i>Ascaris</i> , people and pigs in a rural community of Jiangxi Province, China	545
Gustafsson, M. K. S., Lindholm, A. M., Terenina, N. B. and Reuter, M. NO nerves in a tapeworm. NADPH-diaphorase histochemistry in adult <i>Hymenolepis diminuta</i>	559
Favia, G., Lanfrancotti, A., Della Torre, A., Cancrini, G. and Coluzzi, M. Polymerase chain reaction-identification of <i>Dirofilaria repens</i> and <i>Dirofilaria immitis</i>	567
Lewis, E. E., Ricci, M. and Gaugler, R. Host recognition behaviour predicts host suitability in the entomopathogenic nematode <i>Steinernema carpocapsae</i> (Rhabditida: Steinernematidae)	573
Jones, J. T., Curtis, R. H., Wightman, P. J. and Burrows, P. R. Isolation and characterization of a putative collagen gene from the potato cyst nematode <i>Globodera pallida</i>	581
Curtis, R. H. C. Identification and <i>in situ</i> and <i>in vitro</i> characterization of secreted proteins produced by plant-parasitic nematodes	589

