

JOURNAL
— *of* —
HELMINTHOLOGY

SPECIAL ISSUE

Includes a keynote paper on the biosystematics
of entomopathogenic nematodes
sponsored by COST 819



INTERNATIONAL INSTITUTE OF PARASITOLOGY

An Institute of CAB INTERNATIONAL

JOURNAL
of
HELMINTHOLOGY

Aims and Scopes

The *Journal of Helminthology* provides an international vehicle for the publication of original papers and review articles on all aspects of pure and applied helminthology, particularly those helminth parasites of environmental health, medical or veterinary importance. For those wishing to contribute research papers, work on helminths in wildlife hosts including plant and insect parasites will also be welcome. Taxonomic contributions will be acceptable if they contribute to the systematics of a group and particularly if they employ biochemical or molecular biological techniques. Research notes are also included.

The *Journal of Helminthology* is published quarterly by CAB INTERNATIONAL.

Editor

Professor John Lewis

Royal Holloway, University of London, UK

Tel: +44 (0)1784 443182 Fax: +44 (0)1784 470756 Email: j.w.lewis@rhbnc.ac.uk

Assistant Editor

Hilary White

International Institute of Parasitology, St Albans, Herts, UK

Tel: +44 (0)1727 833151 Fax: +44 (0)1727 868721 Email: jhelm@cabi.org

Editorial Board

- | | |
|--|--|
| Professor A.E. Bianco, <i>Liverpool School of Tropical Medicine, Liverpool, UK</i> | Professor P.W. Pappas, <i>The Ohio State University, Columbus, USA</i> |
| Professor C. Bryant, <i>The Australian National University, Canberra, Australia</i> | Dr R.N. Perry, <i>IACR - Rothamsted, Harpenden, UK</i> |
| Professor C. Combes, <i>University of Perpignan, France</i> | Dr P. Schantz, <i>Centers for Disease Control, Atlanta, USA</i> |
| Dr A.P. Dobson, <i>Princeton University, USA</i> | Professor Lord Soulsby, <i>Old Barn House, Cambridge, UK</i> |
| Professor B. Fried, <i>Lafayette College, Easton, USA</i> | Professor K. Sugane, <i>Shinshu University School of Medicine, Matsumoto City, Japan</i> |
| Professor D.W. Halton, <i>The Queen's University, Belfast, Northern Ireland</i> | Professor M.G. Taylor, <i>London School of Hygiene & Tropical Medicine, London, UK</i> |
| Professor C.R. Kennedy, <i>University of Exeter, UK</i> | Dr D.P. Thompson, <i>Pharmacia & Upjohn Inc., USA</i> |
| Professor P. Nansen, <i>The Royal Veterinary & Agricultural University, Frederiksberg, Denmark</i> | Professor R.C.A. Thompson, <i>Murdoch University, Perth, Australia</i> |
| | Professor D. Wakelin, <i>University of Nottingham, UK</i> |

The Editor and Editorial Board acknowledge the support of the Director and Scientific staff of the International Institute of Parasitology.

©CAB INTERNATIONAL 1997. All rights reserved.
Published by CAB INTERNATIONAL, Wallingford, UK: New York, USA

Journal of Helminthology

Editorial	269
Keynote Paper	
Hominick, W.M., Briscoe, B.R., del Pino, F.G., Heng, J., Hunt, D.J., Kozodoy, E., Mracek, Z., Nguyen, K.B., Reid, A.P., Spiridonov, S., Stock, P., Sturhan, D., Waturu, C. & Yoshida, M. Biosystematics of entomopathogenic nematodes: current status, protocols and definitions ..	271
Research Papers	
Ben, G.J.M., Malmassari, S.L., Nuñez, G.G., Costantino, S.N. & Venturiello, S.M. Evaluation of an enzymatic immunohistochemical technique in human trichinellosis	299
Blair, D., Agatsuma, T. & Watanobe, T. Molecular evidence for the synonymy of three species of <i>Paragonimus</i> , <i>P. ohirai</i> Miyazaki, 1939, <i>P. iloktsuenensis</i> Chen, 1940 and <i>P. sadoensis</i> Miyazaki et al., 1968	305
González-Lanza, C., Manga-González, M.Y., Campo, R. & Del-Pozo, M.P. Larval development of <i>Dicrocoelium dendriticum</i> in <i>Cernuella (Xeromagna) cespitum arigonis</i> under controlled laboratory conditions	311
Nielsen, M.E. & Buchmann, K. Glutathione-s-transferase is an important antigen in the eel nematode <i>Anguillicola crassus</i>	319
Pandya, U., Saxena, J.K. & Shukla, O.P. Filarial DNA and its interaction with polyamines and antifilarial drugs.....	325
Piacenza, L., Acosta, D., Dowd, A., McGonicle, S., Dalton, J. & Carmona, C. Proteinases secreted by <i>Fasciola hepatica</i> : time course of the inhibitory effect of serum from experimentally infected rabbits demonstrated by gelatin-substrate polyacrylamide gel electrophoresis.....	333
Šoltýs, J., Borošková, Z. & Dvorožňáková, E. Effects of concurrently administered copper and mercury on phagocytic cell activity and antibody levels in guinea pigs with experimental ascariasis.....	339
Srisawangwong, T., Pinlaor, S., Kanla, P. & Sithithaworn, P. <i>Centrocestus formosanus</i> : surface morphology of metacercaria, adult and egg.....	345
Sudati, J.E., Rivas, F. & Fried, B. Effect of a high protein diet on worm recovery, growth and distribution of <i>Echinostoma caproni</i> in ICR mice	351
Research Notes	
Garat, B., Esperón, P., Martínez, C., Robello, C. & Ehrlich, R. Presence of a conserved domain of GATA transcription factors in <i>Echinococcus granulosus</i>	355
Roy, E.A. & Beveridge, I. Abnormal spicule development in a laboratory strain of <i>Trichostrongylus vitrinus</i>	359
Index of Authors (Volume 71).....	363
Index of Contents (Volume 71).....	367

Journal of Helminthology is covered in *Current Contents®/Agriculture, Biology & Environmental Sciences*, *SciSearch®*, *Research Alert®*, *BIOSIS*, *CAB ABSTRACTS*, and *Excerpta Medica*

Journal of Helminthology

Volume 71 1997

ISSN: 0022-149X

Publishing, Production, Marketing, and Subscription Sales Office:

CAB INTERNATIONAL

Wallingford

Oxon OX10 8DE

UK

Tel: +44(0)1491 832111

Fax: +44 (0)1491 826090

Email: cabi@cabi.org

Telex: 847964 (COMAGG G)

For Customers in North America:

CAB INTERNATIONAL

198 Madison Avenue

New York

NY 10016

USA

Tel: 212 726 6490 or 212 726 6491

[Toll-free: 1800 528 4841]

Fax: 212 686 7993

Email: cabi-nao@cabi.org

CAB INTERNATIONAL also has regional offices in
Malaysia, Trinidad & Tobago, and Kenya.

Publisher: Philip Edge

Publishing Editor: David Nicholson

Product Manager (Marketing): Tania Fisher

The *Journal of Helminthology* is an international journal
published quarterly by CAB INTERNATIONAL in March,
June, September and December.

Special sales and supplements:

This journal accepts advertising and inserts. We also
provide bulk reprints of suitable papers to meet teaching or
promotional requirements. The journal also publishes
abstracts and proceedings on behalf of academic and
corporate sponsors. Please contact David Nicholson at the
Wallingford address for further details.

Subscription information:

The subscription rates for Volume 71, 1997

(4 issues) are:

Non-member country: £140.00

Member Country*: £112.00

US Dollars (Americas only): \$245.00

(* Member Countries include UK, Canada, India, China,
Australia, New Zealand. For a full list please apply to CAB
INTERNATIONAL.)

Japanese Agent: Maruzen Company Ltd, PO Box 5050, Tokyo
International, 100-31, Japan

Personal subscription and multiple year subscription
discounts are available on request: please contact the
Product Manager at the address above.

Any **supplements** to this journal published in the course of the
annual volume are normally supplied to subscribers at no extra
charge

Back volumes are available. Please contact CAB
INTERNATIONAL for further information.

Claims for non-receipt of journal issues will be considered on
their merit and only if the claim is received within six months of
publication. Replacement copies supplied after this date will be
chargeable.

Despatch: deliveries outside the UK are by ASP Printflow
Airsaver unless other arrangements are made. Customers
requiring airmail delivery should indicate clearly their
requirements and add an additional 10% to the relevant
subscription price.

US POSTMASTERS: please send address corrections to CAB
INTERNATIONAL at the Wallingford address.

Information for Authors

Three copies of the manuscript and artwork should be sent to:

The Editorial Office

Journal of Helminthology

International Institute of Parasitology

395A Hatfield Road

St Albans

Herts AL4 0XU, UK

Notes for Authors are available from this address if not printed
in this issue of the journal.

Offprints: The author (or main author) of an accepted paper
will receive 50 free offprints and a copy of the journal issue in
which their paper is published. Additional offprints are
available for a fee and should be ordered at proof stage. **No
page charges are levied by this journal.**

Copyright: CAB INTERNATIONAL, 1997. All rights reserved:
permission for reproduction of any part of the journal (text,
figures, tables or other matter) in any form (on paper,
microfiche or electronically) should be sought directly from the
Publisher, or a licence permitting restricted copying obtained
from the Copyright Licensing Agency, Tottenham Court Road,
London W1P 9HE, UK, or in the USA by the Central Clearance
Center, 27 Congress Street, Salem MA01970.

Disclaimer: The information contained herein, including any
expression of opinion and any projection or forecast, has been
obtained from or is based upon sources believed by us to be
reliable, but is not guaranteed as to accuracy or completeness.
The information is supplied without obligation and on the
understanding that any person who acts upon it or otherwise
changes his/her position in reliance thereon does so entirely at
his/her own risk.

CAB INTERNATIONAL does not accept responsibility for any
trade advertisement included in this publication.

This journal is printed on acid-free paper from renewable sources
Printed at the University press, Cambridge.