

CAMBRIDGE

JOURNALS



# Animal Health Research Reviews

Published in collaboration with the Conference of Research Workers in Animal Diseases

**Animal Health Research Reviews** is available online at [journals.cambridge.org/ahr](http://journals.cambridge.org/ahr)

**Editor-in-Chief**

C. Gyles, University of Guelph, Canada

**To subscribe contact Customer Services**

**in Cambridge:**  
Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**  
Phone (845) 353 7500  
Fax (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

*Animal Health Research Reviews* provides an international forum for the publication of reviews and commentaries on all aspects of animal health. The journal covers all facets of animal health and science, including but not limited to both infectious and non-infectious diseases in domestic and wild animals.

Price information is available at [journals.cambridge.org/ahr](http://journals.cambridge.org/ahr)

**Free email alerts**

Keep up-to-date with new material – sign up at [journals.cambridge.org/register](http://journals.cambridge.org/register)

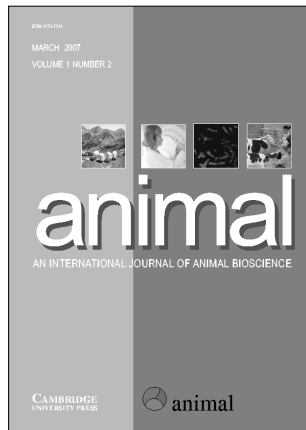
For a free online sample visit [journals.cambridge.org/ahr](http://journals.cambridge.org/ahr)



**CAMBRIDGE**  
UNIVERSITY PRESS

CAMBRIDGE

JOURNALS



# animal

Published for The Animal Consortium  
([www.animal-journal.eu](http://www.animal-journal.eu))

**animal**

is available online at  
[journals.cambridge.org/anm](http://journals.cambridge.org/anm)

**To subscribe contact  
Customer Services**

**in Cambridge:**

Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**

Phone (845) 353 7500  
Fax (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Editor-in-Chief**

Michel Doreau, INRA, France

*animal* publishes original, cutting-edge research and horizon-scanning reviews on animal-related aspects of the life sciences at the molecular (transcriptomics and proteomics), cellular, organ whole animal and production system levels (both animal and human). Papers will be considered in aspects of both strategic and applied science in the areas of Animal Breeding and Genetics, Nutrition, Physiology and Functional Biology of Systems, Behaviour, Health and Welfare, Livestock Farming Systems and Product Quality.

In addition to *animal* the *Proceedings of the British Society of Animal Science* can be purchased at a price of £50/\$95/€75.  
Print ISSN: 1752-7562

Price information is available at  
[journals.cambridge.org/anm](http://journals.cambridge.org/anm)

**Free email alerts**

Keep up-to-date with new material –  
sign up at [www.journals.cambridge.org/register](http://www.journals.cambridge.org/register)

For a free online sample visit  
[journals.cambridge.org/anm](http://journals.cambridge.org/anm)



**CAMBRIDGE**  
UNIVERSITY PRESS

CAMBRIDGE

JOURNALS



# Journal of Dairy Research

**Journal of Dairy Research**  
is available online at  
[journals.cambridge.org/dar](http://journals.cambridge.org/dar)

**To subscribe contact  
Customer Services**

**in Cambridge:**  
Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**  
Phone (845) 353 7500  
Fax (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Executive Editors**

D. G. Chamberlain, Hannah Research Park, UK  
E. C. Needs, Hannah Research Park, UK

*Journal of Dairy Research* publishes original scientific research on all aspects of mammary biology and dairy science including: animal husbandry; the physiology and biochemistry of lactation; milk production; biotechnology and food science; relevant studies in bacteriology, enzymology and immunology; and the development of methods relevant to these subjects.

Price information is available at  
[journals.cambridge.org/dar](http://journals.cambridge.org/dar)

**Free email alerts**

Keep up-to-date with new material –  
sign up at [journals.cambridge.org/register](http://journals.cambridge.org/register)

For a free online sample visit  
[journals.cambridge.org/dar](http://journals.cambridge.org/dar)



**CAMBRIDGE**  
UNIVERSITY PRESS

CAMBRIDGE

JOURNALS



# Journal of Helminthology

**Journal of Helminthology**

is available online at  
[journals.cambridge.org/jhl](http://journals.cambridge.org/jhl)

**To subscribe contact  
Customer Services**

**in Cambridge:**

Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**

Phone (845) 353 7500  
Fax (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Editor**

John Lewis, Royal Holloway, University of London, UK

*Journal of Helminthology* publishes original papers and review articles on all aspects of pure and applied helminthology, particularly those helminth parasites of environmental health, medical or veterinary importance. Research papers on helminths in wildlife hosts, including plant and insect parasites, are also published along with taxonomic papers contributing to the systematics of a group. The journal will be of interest to academics and researchers involved in the fields of human and veterinary parasitology, public health, microbiology, ecology and biochemistry.

**Price information is available at  
[journals.cambridge.org/jhl](http://journals.cambridge.org/jhl)**

**Free email alerts**

Keep up-to-date with new material –  
sign up at [journals.cambridge.org/register](http://journals.cambridge.org/register)

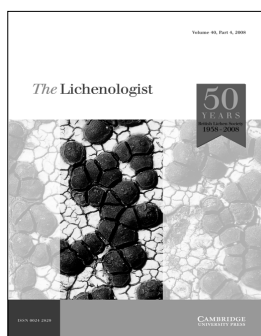
*For a free online sample visit  
[journals.cambridge.org/jhl](http://journals.cambridge.org/jhl)*



**CAMBRIDGE  
UNIVERSITY PRESS**

CAMBRIDGE

JOURNALS



# The Lichenologist

***The Lichenologist***

is available online at  
[journals.cambridge.org/lic](http://journals.cambridge.org/lic)

**To subscribe contact  
Customer Services**

**in Cambridge:**

Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**

Phone (845) 353 7500  
Fax (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Senior Editor**

Peter D. Crittenden, University of Nottingham, UK

*The Lichenologist* is the premier scientific journal devoted exclusively to the study of lichens worldwide. As the leading forum for the dissemination of new concepts and topical reviews, *The Lichenologist* reaches more scientists concerned with the study of lichens and lichen symbionts than any other single journal. All aspects of lichenology are considered from systematics and molecular biology to eco-physiology and biogeography.

Price information is available at  
[journals.cambridge.org/lic](http://journals.cambridge.org/lic)

**Free email alerts**

Keep up-to-date with new material –  
sign up at [journals.cambridge.org/register](http://journals.cambridge.org/register)

For a free online sample visit  
[journals.cambridge.org/lic](http://journals.cambridge.org/lic)



**CAMBRIDGE**  
UNIVERSITY PRESS

CAMBRIDGE

JOURNALS



# Journal of Tropical Ecology

**Journal of Tropical Ecology**  
is available online at  
[journals.cambridge.org/tro](http://journals.cambridge.org/tro)

**To subscribe contact  
Customer Services**

**in Cambridge:**  
Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**  
Phone (845) 353 7500  
Fax (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Editor**

Ian Turner, Winchelsea, UK

*Journal of Tropical Ecology* publishes papers in the important and now established field of the ecology of tropical regions, either arising from original research (experimental or descriptive) or forming significant reviews. The journal provides a platform for the dissemination of information on all aspects of tropical communities and ecosystems.

Price information is available at  
[journals.cambridge.org/tro](http://journals.cambridge.org/tro)

**Free email alerts**

Keep up-to-date with new material –  
sign up at [journals.cambridge.org/register](http://journals.cambridge.org/register)

For a free online sample visit  
[journals.cambridge.org/tro](http://journals.cambridge.org/tro)



**CAMBRIDGE**  
UNIVERSITY PRESS

## 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, USA. 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 \$16.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0031–1820/2009 \$16.00.

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

**ISI Tear Sheet Service.** 3501 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.

**Online submission.** Authors are encouraged to submit their manuscripts online. Go to <http://mc.manuscriptcentral.com/par/> to open an author's account for Parasitology. Manuscript Central is helping to improve the speed of the publication process for the journal.

**Front Cover illustration:** Immunofluorescence of *Trypanosoma cruzi* arginine kinase. Epimastigotes reacted with arginine kinase antibody (A) and the specific markers hexokinase (HK) and cruzipain (CZ) antibodies (B). DAPI staining (C) and merged images (D). From Miranda *et al.* Vol. 136(10), pp. 1201–1207.

© Cambridge University Press 2009

The Edinburgh Building, Cambridge CB2 8RU, United Kingdom  
32 Avenue of The Americas, New York, NY 10013-2473, USA  
477 Williamstown Road, Port Melbourne, VIC 3207, Australia  
Ruiz de Alarcón 13, 28014 Madrid, Spain  
Dock House, The Waterfront, Cape Town 8001, South Africa

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

# PARASITOLOGY

## CONTENTS

### RESEARCH ARTICLES

**Molecular characterization of *Giardia duodenalis* isolated from Semai Pahang Orang Asli (Peninsular Malaysia aborigines)**

A. K. Mohammed Mahdy, Johari Surin, A. Mohd-Adnan, K.-L. Wan and Y. A. L. Lim

1237

***Leishmania major* H-line attenuated under pressure of gentamicin, induces a Th1 response which protects susceptible BALB/c mice against infection with virulent *L. major***

Hamid Daneshvar, Richard Burchmore, Paul Hagan and R. Stephen Phillips

1243

**Detection of *Neospora caninum* in aborted bovine fetuses and dam blood samples by nested PCR and ELISA and seroprevalence in Beijing and Tianjin, China**

L. Yao, N. Yang, Q. Liu, M. Wang, W. Zhang, W. F. Qian, Y. F. Hu and J. Ding

1251

***Schistosoma mansoni* cercariae experience influx of macromolecules during skin penetration**

J. Thornhill, P. M. Z. Coelho, P. McVeigh, A. Maule, A. D. Jurberg and J. R. Kusel

1257

**The diversity, distribution and host-parasite associations of trypanosomes in Western Australian wildlife**

S. Averis, R. C. A. Thompson, A. J. Lymbery, A. F. Wayne, K. D. Morris and A. Smith

1269

**Cytotoxicity of quahog parasite unknown (QPX) toward hard clam (*Mercenaria mercenaria*) haemocytes and interactions between different pathogen isolates and host strains**

Mickael Perrigault and Bassem Allam

1281

**Parasite communities of a fish assemblage from the intertidal rocky zone of central Chile: similarity and host specificity between temporal and resident fish**

G. Muñoz and Y. Cortés

1291

**Phenotypic plasticity of taxonomic and diagnostic structures in gyrodactylosis-causing flatworms (Monogenea, Platyhelminthes)**

K. Olstad, L. Bachmann and T. A. Bakke

1305

**Cold tolerance in sealworm (*Pseudoterranova decipiens*) due to heat-shock adaptations**

S. K. Stormo, K. Præbel and E. O. Elvevoll

1317

**Electron microscopical study to assess the *in vitro* effects of the synthetic trioxolane OZ78 against the liver fluke, *Fasciola hepatica***

L. Halferty, J. F. O'Neill, G. P. Brennan, J. Keiser and I. Fairweather

1325

**Pharmacological action of tick saliva upon haemostasis and the neutralization ability of sera from repeatedly infested hosts**

J. Reck Jr., M. Berger, F. S. Marks, R. B. Zingali, C. W. Canal, C. A. S. Ferreira, J. A. Guimarães and C. Termignoni

1339

**Flea infestation reduces the life span of the common vole**

G. Devevey and P. Christe

1351

**Increased susceptibility to *Strongyloides venezuelensis* in mice due to *Mycobacterium bovis* co-infection which modulates production of Th2 cytokines**

A. M. Carmo, M. A. Vicentini, A. T. Dias, L. L. Alves, C. C. S. Alves, J. S. Brandi, M. L. De Paula, A. Fernandes, M. M. Barsante, M. A. Souza, H. C. Teixeira, D. Negrão-Corrêa and A. P. Ferreira

1357

***Ligula intestinalis* (Cestoda: Diphylobothriidae) in Kenya: a field investigation into host specificity and behavioural alterations**

J. R. Britton, M. C. Jackson and D. M. Harper

1367

**Being successful in the world of narrow opportunities: transmission patterns of the trematode *Ichthyocotylurus pileatus***

A. Faltýnková, A. Karvonen, M. Jyrkkä and E. T. Valtonen

1375