Animal Health Research Reviews

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

Editor-in-Chief

C. Gyles, University of Guelph, Canada

Animal Health Research Reviews provides an international forum for the publication of reviews and commentaries on all aspects of animal health. Papers include in-depth analyses and broader overviews of all facets of health and science in both domestic and wild animals. Major subject areas include physiology and pharmacology, parasitology, bacteriology, food and environmental safety, epidemiology and virology. The journal will be of interest to researchers involved in animal health, parasitologists, food safety experts and academics interested in all aspects of animal production and welfare.



Free email alerts

Keep up-to-date with new content

http://journals.cambridge.org/ahr-alerts



Animal Health Research Reviews is available online at:

http://journals.cambridge.org/ahr

To subscribe contact Customer Services

Americas:

Phone +1 (845) 353 7500 Fax +1 (845) 353 4141 Email subscriptions_newyork@cambridge.org

Rest of world:

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

Price Information

is available at: http://journals.cambridge.org/ahr

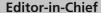


CAMBRIDGE

JOURNALS

animal

Published for The Animal Consortium www.animal-journal.eu



Jean Noblet, INRA, Rennes-St Gilles, France

animal publishes original cutting-edge research, 'hot' topics and horizon-scanning reviews on animal-related aspects of the life sciences at the molecular, cellular, organ, whole animal and production system levels.

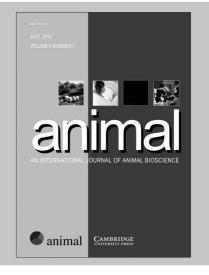
The main subject areas include: breeding and genetics; nutrition; physiology and functional biology of systems; behaviour, health and welfare; farming systems, environmental impact and climate change; product quality, human health and well-being.

For free online content visit:

http://journals.cambridge.org/anmsample

Free email alerts

Keep up-to-date with new content http://journals.cambridge.org/anm-alerts



animal

is available online at: http://journals.cambridge.org/anm

To subscribe contact Customer Services

Americas:

Phone +1 (845) 353 7500
Fax +1 (845) 353 4141
Email
subscriptions_newyork@cambridge.org

Rest of world:

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

Price Information

is available at: http://journals.cambridge.org/anm



Epidemiology and Infection

Editor-in-Chief

Norman Noah, London School of Hygiene and Tropical Medicine, UK

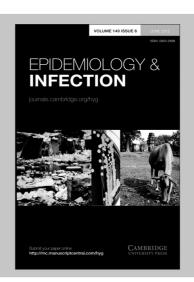
Epidemiology and Infection publishes original reports and reviews on all aspects of infection in humans and animals. Particular emphasis is given to the epidemiology, prevention and control of infectious diseases. The field covered is broad and includes the zoonoses, tropical infections, food hygiene, vaccine studies, statistics and the clinical, social and public health aspects of infectious disease. Papers covering microbiology and immunology, which have an epidemiological relevance, are part of this broad field. Papers come from medical and veterinary scientists worldwide. It has become the key periodical in which to find the latest reports on recently discovered infections and new technology. For those concerned with policy and planning for the control of infections, the papers on mathematical modelling of epidemics caused by historical, current and emergent infections, will be of particular value.

Price information

is available at: http://journals.cambridge.org/hyg

Free email alerts

Keep up-to-date with new material – sign up at http://journals.cambridge.org/alerts



Epidemiology and Infection

is available online at: http://journals.cambridge.org/hyg

To subscribe contact Customer Services

in Cambridge:

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

in New York:

Phone +1 (845) 353 7500
Fax +1 (845) 353 4141
Email
subscriptions_newyork@cambridge.org

For free online content visit: http://journals.cambridge.org/hyg



Journal of Tropical Ecology

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. First published in 1985, Journal of Tropical Ecology has become a major international ecological journal. With clear, stimulating and readable reports of recent research findings, the journal provides a platform for the dissemination of information on all aspects of tropical communities and ecosystems

Price information

is available at: http://journals.cambridge.org/tro

Free email alerts

Keep up-to-date with new material – sign up at http://journals.cambridge.org/tro-alerts



Journal of Tropical Ecology is available online at: 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

in New York:

Phone +1 (845) 353 7500
Fax +1 (845) 353 4141
Email
subscriptions_newyork@cambridge.org

For free online content visit: http://journals.cambridge.org/tro





Curing 'the bends'

Hill and Greenwood decompressed themselves, without any serious symptoms, after short exposures at excess pressures of as much as five and even six atmospheres."

From 'The Prevention of Compressed Air Illness', Journal of Hygiene, 1908

This breakthrough article included early research into decompression and the first ever dive tables.

It's just one of the treasures in the Cambridge Journals Digital Archive

journals.cambridge.org/thebends



Leading titles across multiple disciplines

Access today at: journals.cambridge.org



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 0031–1820/2013 \$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: Upper left: Yak herd crossing a river on the Tibetan plateau (altitude 4200m), Shiqu prefecture, Western Sichuan, July 2002. Lower left: Winter pastures in the Niniu valley (altitude 4200 m), Western Sichuan, May 2006. Central image: Echinococcoses, cysticercosis and taeniases represent a large disease burden in China and neighbouring countries. Coloured circles locate some of the areas where international and multidisciplinary research programmes on the transmission of both E. granulosus and E. multilocularis have been carried out during the last 20 years (see legend in Giraudoux et al. in this Special Issue of Parasitology). Upper right: Tibetan family resting after field work, Niniu village, Western Sichuan, May 2006. Note the grandmother patting the young dog which is lying alongside a yak dung heap, almost certainly mixed with dog faeces, and the child thumb sucking, all behaviours which confer a high risk for the transmission of Echinococcus infection. Lower right: Dogs scavenging on a sheep carcass in the vicinity of Sary-Mogol village (altitude 3000 m), Alay valley, South Kyrgyztan, May 2012.

All images are originals and kindly supplied by Patrick Giraudoux.

© Cambridge University Press 2013

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 C/ Orense, 4, Planta 13 28020 Madrid, Spain Lower Ground Floor, Nautica Building, The Water Club, Beach Road, Granger Bay, 8005 Cape Town, South Africa

Printed in the UK by Bell & Bain

PARASITOLOGY

CONTENTS

PREFACE: Control of cestode zoonoses in Asia: role of basic and applied science Akira Ito, Xiao-Nong Zhou, Philip S. Craig and Patrick Giraudoux	1547	Genetic diversity of Echinococcus spp. in Russia Sergey V. Konyaev, Tetsuya Yanagida, Minoru Nakar Galina M. Ingovatova, Yakov N. Shoykhet, Alexandr Valeriy A. Odnokurtsev, Kyunnyay S. Loskutova, Gulnur I. Lukmanova, Nikolai E. Dokuchaev, Sergey Mikhail V. Alshinecky, Tatyana N. Sivkova, Oleg N. Ar Sergey A. Abramov, Anton V. Krivopalov, Sergey V. P. Natalia V. Lopatina, Tamara A. Dupal, Yasuhito Sako Echinococcus species from red foxes, corsac fo wolves in Mongolia Akira Ito, Gantigmaa Chuluunbaatar, Tetsuya Yanagi Anu Davaasuren, Battulga Sumiya, Mitsuhiko Asaka Toshiaki Ki, Kazuhiro Nakaya, Abmed Davaajav, Temuulen Dorjsuren, Minoru Nakao and Yasuhito Sa
ing is perfect! Trouble-shooting in immunological and cular studies of cestode infections	1551	
Control of <i>Taenia solium</i> taeniasis/cysticercosis: past practices and new possibilities Marshall W. Lightowlers	1566	
Advances in diagnosis and spatial analysis of cysticercosis and taeniasis Francis Raoul, Tiaoying Li, Yasuhito Sako, Xingwang Chen, Changping Long, Tetsuya Yanagida, Yunfei Wu,		
Minoru Nakao, Munehiro Okamoto, Philip S. Craig, Patrick Giraudoux and Akira Ito	1578	Patrick Giraudoux, Francis Raoul, Eve Afonso, Isken Yurong Yang, Li Li, Tiaoying Li, Jean-Pierre Quéré, X Qian Wang, Hao Wen, Akira Ito and Philip S. Craig
Simple and reliable preparation of immunodiagnostic antigens for <i>Taenia solium</i> cysticercosis Yasuhito Sako, Sonoyo Itoh, Munehiro Okamoto,		
Kazuhiro Nakaya and Akira Ito Genotypic relationships between <i>Taenia saginata</i> , <i>Taenia</i>	1589	The emergence of echinococcosis in central Asi P. R. Torgerson
asiatica and their hybrids Kanako Yamane, Tetsuya Yanagida, Tiaoying Li, Xingwang Chen, Paron Dekumyoy, Jitra Waikagul, Agathe Nkouawa, Minoru Nakao, Yasuhito Sako, Akira Ito, Hiroshi Sato and Munehiro Okamoto	1595	Dog ownership, dog behaviour and transmission Echinococcus spp. in the Alay Valley, southern K Freya van Kesteren, Alexander Mastin, Bermet Myty Iskender Ziadinov, Belgees Boufana, Paul R. Torgers Michael T. Rogan and Philip S. Craig
Detection of human taeniases in Tibetan endemic areas, China Tiaoying Li, Xingwang Chen, Tetsuya Yanagida, Hao Wang, Changping Long, Yasuhito Sako, Munehiro Okamoto, Yunfei Wu, Patrick Giraudoux, Francis Raoul, Agathe Nkouawa, Minoru Nakao, Philip S. Craig and Akira Ito	1602	Reinfection studies of canine echinococcosis ard dogs in transmission of <i>Echinococcus multilocus</i> . Tibetan communities, Sichuan, China J. E. Moss, X. Chen, T. Li, J. Qiu, Q. Wang, P. Giraud A. Ito, P. R. Torgerson and P. S. Craig
Taeniases and cysticercosis in Indonesia: past and present situations Toni Wandra, Akira Ito, Kadek Swastika, Nyoman S. Dharmawan, Yasuhito Sako and Munehiro Okamoto	1608	Detecting nested clusters of human alveolar ech Zeinaba Said-Ali, Frédéric Grenouillet, Jenny Knapp, Solange Bresson-Hadni, Dominique Angèle Vuitton, Francis Raoul, Carine Richou, Laurence Millon, Patrick Giraudoux and The Francechino Network
Current status of the genetics and molecular taxonomy of <i>Echinococcus</i> species D. P. McManus	1617	
Mitochondrial phylogeny of the genus <i>Echinococcus</i> (Cestoda: Taeniidae) with emphasis on relationships among <i>Echinococcus canadensis</i> genotypes Minoru Nakao, Tetsuya Yanagida, Sergey Konyaev, Antti Lavikainen, Valeriy A. Odnokurtsev, Vladimir A. Zaikov and		

cus spp. in Russia agida, Minoru Nakao, Shoykhet, Alexandr Y. Bondarev, y S. Loskutova, Dokuchaev, Sergey Spiridonov, Sivkova, Oleg N. Andreyanov, vopalov, Sergey V. Karpenko, upal, Yasuhito Sako and Akira Ito 1637 d foxes, corsac foxes, and atar, Tetsuya Yanagida, /a, Mitsuhiko Asakawa, med Davaajav, ao and Yasuhito Sako 1648 chinococcus multilocularis in , Eve Afonso, Iskender Ziadinov, ean-Pierre Quéré, Xiaohui Feng, and Philip S. Craig 1655 osis in central Asia 1667 r and transmission of Valley, southern Kyrgyzstan lastin, Bermet Mytynova, ana, Paul R. Torgerson, 1674 raig echinococcosis and role of ococcus multilocularis in China Q. Wang, P. Giraudoux, 1685 uman alveolar echinococcosis uillet, Jenny Knapp,



1625





1693

Akira Ito