ISSN: 0031-1820

PARASITOLOGY

journals.cambridge.org/par

Submit your paper online http://mc.manuscriptcentral.com/par



Editor-in-Chief R. S. Phillips

Editor – Special Issues L. H. Chappell

Editors A. Hemphill, C. Holland, D. P. Knox, J. Wastling

Assistant Editor M. Elisabeth Painter



Parasitology

EDITOR-IN-CHIEF R. S. PHILLIPS

EDITOR – SPECIAL ISSUES L. H. CHAPPELL

EDITORS

A. HEMPHILL, C. HOLLAND, D. P. KNOX, J. WASTLING

EDITORIAL POLICY

Parasitology publishes definitive papers on all aspects of pure and applied parasitology including biochemistry, molecular biology, immunology, genetics, ecology and physiology and also the application of new techniques, long-term epidemiology studies, advances in the understanding of life-cycles, chemotherapy and major systematic revisions. Papers should normally be full length with an explanatory introduction and detailed discussion of the findings reported. Shorter reports of particularly important findings will also be considered.

To submit papers online, go to http://mc.manuscriptcentral.com/par/

J. M. BEHNKE, University of Nottingham, UK V. MCDONALD, Barts and the London School C. BJÖRKMAN, Swedish University of Agricultural of Medicine and Dentistry, UK Sciences, Sweden E. MORGAN, University of Bristol, UK A. BOWMAN, University of Aberdeen, UK S. A. NADLER, University of California, Davis, USA K. BREHM, University of Würzburg, Germany H. A. NOYES, University of Liverpool, UK C. BRITTON, University of Glasgow, UK S. O'NEILL, Dublin City University, Ireland F. E. G. COX, London School of Hygiene & Tropical R. POULIN, University of Otago, New Zealand S. E. RANDOLPH, University of Oxford, UK Medicine, London, UK J. T. ELLIS, University of Technology, Sydney, L. RANFORD-CARTWRIGHT, University of Australia Glasgow, UK D. ROLLINSON, Natural History Museum, London, A. FENTON, University of Liverpool, UK T. G. GEARY, McGill University, Canada UK P. GELDHOF, University of Ghent, Belgium T. SCHETTERS, Intervet International, W. HARNETT, Strathclyde Institute for Biomedical The Netherlands Science, UK J. R. STOTHARD, Liverpool School of Tropical H. HELMBY, London School of Hygiene & Tropical Medicine, UK Medicine, UK C. STRUBE, University of Veterinary Medicine, G. HIDE, University of Salford, UK Hannover, Germany A. ITO, Asahikawa Medical College, Japan J. T. TIMI, Universidad Nacional de Mar del M. K. JONES, Queensland Institute of Medical Plata-CONICET, Argentina Research, Australia D. WILLIAMS, University of Liverpool, UK F. KATZER, Moredun Research Institute, UK R. A. WILSON, University of York, UK M. W. KENNEDY, University of Glasgow, UK D. ZARLENGA, USDA, ARS, ANRI, USA M. DE NAZARÉ CORREIA SOEIRO, Fundação Oswaldo P. T. LOVERDE, University of Texas Health Science Centre, USA Cruz, Brazil

Parasitology (ISSN 0031-1820) is published monthly and semi-monthly in April and September.

Subscriptions may be sent to any bookseller or subscription agent or direct to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK. Subscriptions in the USA, Canada and Mexico should be sent to Cambridge University Press, Journals Fulfillment Department,

100 Brook Hill Drive, West Nyack, New York 10994–2133. All orders must be accompanied by payment. The subscription price (excluding VAT) of volume 139, 2012 which includes print and electronic access is £1200 (US \$2100 in the USA, Canada and Mexico), for fourteen parts; the electronic-only price for institutional subscribers is £990 (US \$1850 in the USA, Canada and Mexico); separate parts cost £91 or US \$172 each (plus postage). EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Japanese prices for institutions are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan. Periodicals postage paid at New York, NY and at additional mailing offices. POSTMASTER: send address changes in USA, Canada and Mexico to Parasitology, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994–2133.

Information on back volumes, permissions and advertising is given on the inside back cover.

The Journal is listed in the major relevant abstracting and indexing services worldwide, including Abstracts on Hygiene and Communicable Disease, Biological Abstracts, Biotechnology Research Abstracts, Chemical Abstracts,

Current Awareness in Biological Science, Current Contents, Dairy Science Abstracts, Excerpta Medica, Helminthological Abstracts, Index Medicus, Index Veterinarius, IABS, Protozoological Abstracts, Reviews of Applied Entomology, Tropical Diseases Bulletin, Veterinary Bulletin.

Internet access. This journal is included in the Cambridge Journals Online service which can be found at http://journals.cambridge.org/. For further information on other Press titles access http://www.cambridge.org/.

This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests.

Please see www.fsc.org for information.

ASSISTANT EDITOR M. ELISABETH PAINTER Ph.D.