

Online submission at: www.editorialmanager.com/ber

Volume 101
Issue 4
August 2011

Bulletin of
Entomological
Research



CAMBRIDGE
UNIVERSITY PRESS

ISSN 0007-4853

Bulletin of *Entomological Research*

journals.cambridge.org/ber

Aims and Scope

The aims of *Bulletin of Entomological Research* are to further our global knowledge of entomology through the generalisation of research findings rather than providing more entomological exceptions. *Bulletin* publishes high-quality and original research papers, 'critiques' and review articles concerning insects, mites, ticks or other arthropods of economic importance in agriculture, forestry, stored products, biological control, medicine, animal health and natural resource management. The scope of papers addresses the biology, ecology, behaviour, physiology and systematics of individuals and populations. This includes the interactions between species (plants, hosts for parasites, natural enemies and whole communities), novel methodological developments, including molecular biology, in an applied context. *Bulletin* does not publish the results of spray trials.

Bulletin of Entomological Research is published bimonthly by
Cambridge University Press

Editor-in-Chief

Professor Bill Symondson

School of Biosciences, Cardiff University, Cardiff CF10 3TL, UK
Email: entomology@cambridge.org

Subject Editors

Dr N. Agusti, *IRTA, Spain*

Dr T. Backeljau, *Royal Belgian Institute of Natural Sciences, Belgium*

Professor J.S. Bale, *University of Birmingham, UK*

Dr P. Billingsley, *University of Aberdeen, UK*

Dr D.A. Bohan, *Rothamsted Research, Hertfordshire, UK*

Dr C. Borgemeister, *International Centre of Insect Physiology and Ecology (ICIPE), Kenya*

Dr Chen Xue-Xin, *Zhejiang University, China*

Dr P.J. De Barro, *CSIRO Entomology, Indooroopilly, Australia*

Dr A.P.G. Dowling, *University of California, USA*

Professor D. Giga, *Bulawayo, Zimbabwe*

Dr D. Gillespie, *Agriculture and Agri-Food Canada, Agassiz, B.C., Canada*

Dr M. Greenstone, *Invasive Insect Biocontrol & Behavior Laboratory, Beltsville, USA*

Professor G. Gurr, *Charles Sturt University, NSW, Australia*

Professor D.R. Hall, *University of Greenwich, UK*

Dr N.P. Havill, *USDA Forest Service, Northern Research Station, Hamden, USA*

Dr T.H. Jones, *Cardiff University, UK*

Dr J.D. Knight, *Imperial College, Ascot, UK*

Dr J. Krzywinski, *Liverpool School of Tropical Medicine, UK*

Dr O. Kwon, *Kyungpook National University, Korea*

Professor H.D. Loxdale, *Friedrich-Schiller University, Jena, Germany*

Dr S. Morin, *The Robert H. Smith Faculty of Agriculture, Food and Environment Rehovot, Israel*

Dr Liu Shu-Sheng, *Zhejiang University, China*

Dr G. Port, *University of Newcastle Upon Tyne, UK*

Dr S. Potts, *University of Reading, UK*

Dr G. Purvis, *University College Dublin, Ireland*

Professor G.H.L. Rothschild, *Offham, Kent, UK*

Dr W.E. Snyder, *Washington State University, USA*

Dr A.J.A. Stewart, *University of Sussex, Brighton, UK*

Dr S. Tanaka, *National Institute of Agrobiological Sciences at Ohwashi, Japan*

Dr S.J. Torr, *University of Greenwich, Kent, UK*

Professor H. Townson, *Liverpool School of Tropical Medicine, UK*

Dr M. Traugott, *University of Innsbruck, Austria*

Dr M. Virant-Doberlet, *National Institute of Biology, Ljubljana, Slovenia*

Dr J. Vontas, *University of Crete, Greece*

Dr B.A. Woodcock, *University of Reading, UK*

© Cambridge University Press 2011.

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.

Cover image: Female melon fly, *Bactrocera cucurbitae* (Coquillett), resting on a cucurbit host fruit.

Photographed by Scott Bauer, USDA Agricultural Research Service, USA.

Research Papers

J.C. Piñero, R.F.L. Mau and R.I. Vargas

A comparative assessment of the response of three fruit fly species (Diptera: Tephritidae) to a spinosad-based bait: effect of ammonium acetate, female age, and protein hunger 373

F.C. Leonardo, A.F. da Cunha, M.J. da Silva, M.F. Carazzolle, A.M. Costa-Leonardo, F.F. Costa and G.A. Pereira

Analysis of the workers head transcriptome of the Asian subterranean termite, *Coptotermes gestroi* 383

N.M. Endersby, K. Viduka, S.W. Baxter, J. Saw, D.G. Heckel and S.W. McKechnie

Widespread pyrethroid resistance in Australian diamondback moth, *Plutella xylostella* (L.), is related to multiple mutations in the *para* sodium channel gene 393

T. Brévault, J. Carletto, J. Tribot and F. Vanlerberghe-Masutti

Insecticide use and competition shape the genetic diversity of the aphid *Aphis gossypii* in a cotton-growing landscape 407

M. Tuda

Evolutionary diversification of bruchine beetles: climate-dependent traits and development associated with pest status 415

B.O. Olugbemi

Exploratory and recruitment phases in soldier-mediated foraging activities in the termite, *Coptotermes intermedius* Silvestri (Rhinotermitidae: Coptotermitinae) 423

D.-S. Park, S.-J. Suh, P.D.N. Hebert, H.-W. Oh and K.-J. Hong

DNA barcodes for two scale insect families, mealybugs (Hemiptera: Pseudococcidae) and armored scales (Hemiptera: Diaspididae) 429

K.A. Polson, S.C. Rawlins, W.G. Brogdon and D.D. Chadee

Characterisation of DDT and Pyrethroid Resistance in Trinidad and Tobago populations of *Aedes aegypti* 435

M.P. Walton, H.D. Loxdale and L.J. Allen-Williams

Flying with a 'death sentence' on board: electrophoretic detection of braconid parasitoid larvae in migrating winged grain aphids, *Sitobion avenae* (F.) 443

M. Aluja, L. Guillén, J. Rull, H. Höhn, J. Frey, B. Graf and J. Samietz

Is the alpine divide becoming more permeable to biological invasions? – Insights on the invasion and establishment of the Walnut Husk Fly, *Rhagoletis completa* (Diptera: Tephritidae) in Switzerland 451

D. Chu, C.S. Gao, P. De Barro, F.H. Wan and Y.J. Zhang

Investigation of the genetic diversity of an invasive whitefly (*Bemisia tabaci*) in China using both mitochondrial and nuclear DNA markers 467

D. Chu, C.S. Gao, P. De Barro, Y.J. Zhang, F.H. Wan and I.A. Khan

Further insights into the strange role of bacterial endosymbionts in whitefly, *Bemisia tabaci*: Comparison of secondary symbionts from biotypes B and Q in China 477

H. Delatte, H. Holota, B.H. Warren, N. Becker, M. Thierry and B. Reynaud

Genetic diversity, geographical range and origin of *Bemisia tabaci* (Hemiptera: Aleyrodidae) Indian Ocean Ms 487

**Subscribing organisations are encouraged to copy and distribute this
table of contents for non-commercial purposes**

Bulletin of *Entomological Research*

Volume 101 2011

ISSN: 0007-4853

journals.cambridge.org/ber

Publishing, Production, Marketing, and

Subscription Sales Office:

Cambridge University Press
The Edinburgh Building
Shaftesbury Road
Cambridge CB2 8RU
UK

For Customers in North America:

Cambridge University Press
Journals Fulfillment Dept
100 Brook Hill Drive
West Nyack
New York 10994-2133
USA

Publisher: Katy Christomanou

Bulletin of Entomological Research is an international journal published bimonthly by Cambridge University Press in February, April, June, August, October and December.

Subscription information:

The subscription rates for Volume 101, 2011 (6 issues):
Print and electronic access: £862 (UK), (USA, Canada and Mexico US \$1669)
Electronic-only price: £672 (UK), (USA, Canada and Mexico US \$1307)
Print only: £808 (UK), (USA, Canada and Mexico US \$1557)
The online edition is available at www.journals.cambridge.org/ber with free table of contents alert (upon registration).

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 Cambridge University Press 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.

US Postmasters: please send address corrections to Bulletin of Entomological Research
Cambridge University Press
100 Brook Hill Drive
West Nyack
New York 10994-2133
USA

Information for Authors

Manuscripts should be submitted online at <http://www.editorialmanager.com/ber>. New users should register before submitting a manuscript. Further information about submission is available from the publisher at the given address and is printed on the inside back cover.

Offprints: The author (or main author) of an accepted paper will receive a free PDF of their paper. Paper offprints are available for a fee and should be ordered at proof stage. No page charges are levied by this journal.

Copying: This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA. Organisations in the USA who are registered with the CCC may therefore copy material (beyond the limits permitted by sections 107 and 108 of USA copyright law) subject to payment to the CCC of the per copy fee of \$16.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0007-4853/2011/\$16.00. Organisations authorised by the Copyright Licensing Agency may also copy material subject to the usual conditions. *For all other use*, permission must be sought from Cambridge or the American Branch of Cambridge University Press.

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.

Cambridge University Press does not accept responsibility for any trade advertisement included in this publication.

Typeset by SR Nova Pvt Ltd., Bangalore, India, and printed by Latimer Trend, Plymouth, UK.