

Online submission at: www.editorialmanager.com/ber

**Volume 107
Issue 4
August 2017**

Bulletin of
*Entomological
Research*



**CAMBRIDGE
UNIVERSITY PRESS**

ISSN 0007-4853

Bulletin of Entomological Research

journals.cambridge.org/ber

Aims and Scope

Established in 1910, the internationally recognised *Bulletin of Entomological Research* aims to further global knowledge of entomology through the generalisation of research findings rather than providing more entomological exceptions. The *Bulletin* publishes high quality and original research papers, 'critiques' and review articles concerning insects 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, with a particular emphasis upon the major current and emerging pests of agriculture, horticulture and forestry, and vectors of human and animal diseases. 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. The Bulletin does not publish the results of pesticide testing or traditional taxonomic revisions.

Bulletin of Entomological Research is published bimonthly by
Cambridge University Press

Editor-in-Chief

Dr Paul De Barro

CSIRO Health & Biosecurity, Brisbane,
Queensland 4001, Australia
Email: entomology@cambridge.org

Subject Editors

Dr N. Agusti, IRTA, Spain

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

Dr S. Baxter, University of Adelaide, Australia

Dr L. Boykin, University of Western Australia, Australia

Professor M. Chen, Northwest A&F University, China

Dr Chen Xue-Xin, Zhejiang University, China

Dr P. Cunningham, Queensland University of Technology, Australia

Dr S. Downes, CSIRO, Ecosystem Sciences, Australia

Dr R. Garrick, University of Mississippi, USA

Dr E. Gray, Colorado College, USA

Dr S. Hayward, University of Birmingham, UK

Dr A. K-W. Hee, Universiti Putra Malaysia, Malaysia

Dr H. Hesketh, Centre for Ecology and Hydrology, UK

Dr B. Hoffmann, CSIRO, Ecosystem Sciences, Australia

Professor M. Isman, University of British Columbia, Canada

Dr T.H. Jones, Cardiff University, UK

Dr A. Kapranas, Maynooth University, Ireland

Dr D. Kriticos, CSIRO Black Mountain Labs, Australian Capital Territory, Australia

Dr O. Kwon, Kyungpook National University, Korea

Dr B. Lavandero, Universidad de Talca, Talca, Chile

Professor C-Y. Lee, Universiti Sains Malaysia, Malaysia

Professor S. Li, Shanghai Institutes for Biological Sciences, China

Professor Y. Lu, Chinese Academy of Agricultural Sciences, China

Dr S. Macfayden, CSIRO, Ecosystem Sciences, Australia

Dr N. V. Meyling, University of Copenhagen, Denmark

Professor B. Nault, Cornell University, USA

Dr D. Perez-Staples, INBIOTECA, Universidad Veracruzana, Mexico

Dr C. Robin, University of Melbourne, Australia

Dr E. Roditakis, National Agricultural Research Foundation, Greece

Dr Zhentao Sheng, University of Chicago, USA

Professor P. Stevenson, Royal Botanic Gardens, Kew, UK

Professor J-H. Sun, Chinese Academy of Sciences, China

Dr W.T. Tay, CSIRO Black Mountain Labs, Australian Capital Territory, Australia

Dr L. Thomson, University of Melbourne, Australia

Professor P. Trematerra, University of Molise, Italy

Dr M. Virgilio, Royal Museum for Central Africa, Belgium

Dr K. Wallin, University of Vermont, USA

Dr T. Walsh, CSIRO Health & Biosecurity, Australia

Dr X.-W. Wang, Zhejiang University, Hangzhou, China

Dr S. L. Wee, Universiti Kebangsaan Malaysia, Malaysia

Dr A. Wilby, Lancaster University, UK

Professor L. Winder, UNITEC, Auckland, New Zealand

Dr X.-Y. Hong, Department of Plant Protection, Nanjing Agricultural University, Nanjing

Dr M. Yazdani, University of Adelaide, Australia

Professor W. Zhang, Sun Yat-sen University, China

© Cambridge University Press 2017.

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: A female adult of *Galeruca daurica* (Joannis) mating with a male. *G. daurica* is a new insect pest causing great economic losses in the Inner Mongolia grasslands of China in recent years.

Photo taken by: Bao-Ping Pang.

**Bulletin of
Entomological
Research**

**Volume 107
Issue 4
August 2017**

Review Paper

B.M. Carvalho, E.F. Rangel and M.M. Vale

Evaluation of the impacts of climate change on disease vectors through ecological niche modelling 419

Research Papers

A. Menkis, J. Lynikienė, A. Marciliunas, A. Gedminas and A. Povilaitienė

The great spruce bark beetle (*Dendroctonus micans* Kug.) (Coleoptera: Scolytidae) in Lithuania: occurrence, phenology, morphology and communities of associated fungi 431

G.A. Avila, T.M. Withers and G.I. Holwell

Courtship and mating behaviour in the parasitoid wasp *Cotesia urabae* (Hymenoptera: Braconidae): mate location and the influence of competition and body size on male mating success 439

O.O. Uyi, C. Zachariades, E. Marais and M.P. Hill

Reduced mobility but high survival: thermal tolerance and locomotor response of the specialist herbivore, *Pareuchaetes insulata* (Walker) (Lepidoptera: Erebidae), to low temperatures 448

A. Nardelli, V. Peona, A. Toschi, M. Mandrioli and G.C. Manicardi

Afit: a bioinformatic tool for measuring aphid fitness and invasiveness 458

J. Sipos, J. Hodecek, T. Kuras and A. Dolny

Principal determinants of species and functional diversity of carabid beetle assemblages during succession at post-industrial sites 466

R. Piovezan, J. Paulo O. Acorinthe, A. Visockas, T.S. de Azevedo and C.J. Von Zuben

Effect of heavy-equipment aided environmental nebulization on *Aedes aegypti* vectors of Dengue, Zika and Chikungunya in São Paulo, Brazil 478

C.F. Farder-Gomes, M.A. Oliveira, P.L. Gonçalves, L.M. Gontijo, J.C. Zanuncio,

M.A.L. Bragança and E.M. Pires
Reproductive ecology of phorid parasitoids in relation to the head size of leaf-cutting ants *Atta sexdens* Forel 487

Salwa Abdo Rizk, Ragaa Sayed Abdalla and Rehab Mahmoud Sayed

Changes occurred in the testes and DNA pattern of males wax moth (*Galleria mellonella*) first generation as a result of irradiation of their parents 493

D. Roberts

Mosquito larvae can detect water vibration patterns from a nearby predator 499

Z. Yan, J.J. Yue, C. Bai, Z.Q. Peng and C.H. Zhang

Effects of cold storage on the biological characteristics of *Microplitis croceipes* (Hymenoptera: Braconidae) 506

L.J. Zhang, J.L. Chen, B.L. Yang, X.G. Kong, D. Bourguet and G. Wu

Thermotolerance, oxidative stress, apoptosis, heat-shock proteins and damages to reproductive cells of insecticide-susceptible and -resistant strains of the diamondback moth *Plutella xylostella* 513

R. Alvarenga, J.C. Moraes, A.M. Auad, M. Coelho and A.M. Nascimento

Induction of resistance of corn plants to *Spodoptera frugiperda* (J. E. Smith, 1797) (Lepidoptera: Noctuidae) by application of silicon and gibberellic acid 527

S.J. Gawande, S. Anandhan, A.A. Ingle, Alana Jacobson and R. Asokan

Heteroplasmy due to coexistence of mtCOI haplotypes from different lineages of the *Thrips tabaci* cryptic species group 534

T. Aydin, N. Bayrak, E. Baran and A. Cakir

Insecticidal effects of extracts of *Humulus lupulus* (hops) L. cones and its principal component, xanthohumol 543

L. Li, Y.-T. Zhou, Y. Tan, X.-R. Zhou and B.-P. Pang

Identification of odorant-binding protein genes in *Galeruca daurica* (Coleoptera: Chrysomelidae) and analysis of their expression profiles 550

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

Bulletin of Entomological Research

Volume 107, 2017

ISSN: 0007-4853

cambridge.org/ber

Publishing, Production, Marketing, and Subscription Sales Office:
Cambridge University Press
UPH
Shaftesbury Road
Cambridge CB2 8BS
UK

For Customers in North America:
Cambridge University Press
Journals Fulfillment Dept
1 Liberty Plaza, Floor 20
New York
NY 10006
USA

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 107, 2017 (6 issues):
Print and electronic access: £1445 (UK), (USA, Canada and Mexico US \$2458)
Electronic-only price: £1072 (UK), (USA, Canada and Mexico US \$1824)
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
1 Liberty Plaza, Floor 20
New York
NY 10006
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 0007-4853/2017/\$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 Techset Composition India Pvt Ltd., Chennai, India, and printed in the UK by Bell & Bain Ltd, Glasgow.