

Volume 30    Number 2    June 2010    ISSN 1742-7584



# INTERNATIONAL JOURNAL OF TROPICAL INSECT SCIENCE



**CAMBRIDGE**  
UNIVERSITY PRESS

Published on behalf of *icipe*



**icipe**  
African Insect Science for Food and Health

# INTERNATIONAL JOURNAL OF TROPICAL INSECT SCIENCE

## Editor-in-Chief

C Borgemeister, *icipe-African Insect Science for Food and Health, Kenya*  
E-mail: [ijt@icipe.org](mailto:ijt@icipe.org)

## Regional Editors

**Africa:** A Hassanali, *icipe, Kenya*

**The Americas:** C Cardona, *Centro Internacional de Agricultura Tropical, Colombia*

**Asia:** J Yukawa, *Kyushu University, Japan*

**Australia and Oceania:** R Jackson, *University of Canterbury, New Zealand*

## Founding Editor

T R Odhiambo

## IJT Secretariat Manager

C K Sanginga

## Editorial Board

R Anderson, *University of Winnipeg, Canada*

N Bosque-Pérez, *University of Idaho, USA*

A Chabi-Olaye, *icipe, Kenya*

C Eardley, *Plant Protection Research Institute, South Africa*

H Fadamiro, *Auburn University, USA*

W A Foster, *Ohio State University, USA*

R Hanna, *International Institute of Tropical Agriculture, Benin*

K L Heong, *International Rice Research Institute, The Philippines*

R Kfir, *Plant Protection Research Institute, South Africa*

Y Kunimi, *Tokyo University of Agriculture and Technology, Japan*

B Le Ru, *Institut de recherche pour le développement, France*

Li Long, *Sericulture Research Institute, China*

P Neves, *Universidade Estadual de Londrina, Brazil*

D Obeng-Ofori, *University of Ghana, Ghana*

A Odulaja, *International Atomic Energy Agency, Austria*

Omkar, *University of Lucknow, India*

W A Overholt, *University of Florida, USA*

J A Pickett, *Rothamsted International, UK*

D Premachandra, *University of Ruhuna, Sri Lanka*

J Romeis, *Agroscope Reckenholz-Tänikon Research Station ART, Switzerland*

F Schulthess, *International Institute of Tropical Agriculture, Benin*

M Sétamou, *United States Department of Agriculture-Agricultural Research Service, USA*

A van Huis, *Wageningen University, The Netherlands*

F Vega, *United States Department of Agriculture-Agricultural Research Service, USA*

## Submission of Manuscripts

Manuscripts should be *exclusively* submitted as electronic files (preferably in Microsoft Word) via the link at [www.journals.cambridge.org/jti](http://www.journals.cambridge.org/jti). Authors are requested to maintain a back-up copy in case revision is necessary.

**Full Notes for Authors** are available from:

[journals.cambridge.org/jti](http://journals.cambridge.org/jti), and an abbreviated version is printed at the back of this issue.

## Subscriptions

*International Journal of Tropical Insect Science* (ISSN 1742-7584) is published four times a year in March, June, September and December. The subscription price for institutions of Volume 30 (2010) which includes electronic access and delivery by air is £286 (US \$550 in the USA, Canada and Mexico); online subscription for institutions is £234 (US \$447 in the USA, Canada and Mexico). Single parts are £76 (US \$145 in the USA, Canada and Mexico), plus postage. Claims for missing issues should be made immediately on receipt of the subsequent issue to Cambridge University Press.

Orders, which must be accompanied by payment, may be sent to a bookseller, subscription agent or direct to the publisher:

Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK; or in the USA, Canada and Mexico: Cambridge University Press, Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, New York, 10994-2133. 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.

Copies of the journal for subscribers in the USA, Canada and Mexico are sent by air to New York to arrive with minimum delay. Periodicals postage paid at New York and at additional mailing offices. Postmaster: send address changes in the USA, Canada and Mexico to: *International Journal of Tropical Insect Science*, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994-2133.

## Advertising

Advertising queries for all parts of the world except the USA, Canada and Mexico to the Journals Advertising Co-ordinator: Rebecca Curtis, [ad\\_sales@cambridge.org](mailto:ad_sales@cambridge.org)  
Address enquiries in the USA, Mexico and Canada *only* to: [journals\\_advertising@cup.org](mailto:journals_advertising@cup.org)

## Copying

This journal is registered with the Copyright Clearance Centre, 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 U. S. Copyright law) subject to promotional or commercial purposes. Code 1742-7584/2010 \$16.00. *ISI Tear Sheet Service*, 3501 Market Street, Philadelphia, PA 19104, USA is authorized to supply single copies of separate articles for private use only. Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions. *For all other use, permission should be sought from the UK or American branch of Cambridge University Press.*

*International Journal of Tropical Insect Science* is abstracted/indexed in: CAB Abstracts, BIOSIS, Zoological Record, Chemical Abstracts, The African Book Publishing Record, TROPAG & RURAL Abstracts, IBIDS database and the FAO AGRIS database.

## Internet Access

The online edition (EISSN 1742-7592) is available at: [journals.cambridge.org/jti](http://journals.cambridge.org/jti) with free table of contents alerts (upon registration).

**Main cover image:** The tea mosquito bug *Helopeltis theivora* Waterhouse (Heteroptera: Miridae) and its host plant *Camellia sinensis* (Ericales: Theaceae) by N. Mwangi Komeri.

**Smaller images:** Courtesy of G. Goergen, IITA.

## CAMBRIDGE UNIVERSITY PRESS

The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK

32 Avenue of the Americas, New York, NY 10013-2473, USA  
477 Williamstown Road, Port Melbourne VIC 3207, Australia

Printed by Latimer Trend, Plymouth, UK.

©*icipe* 2010. All rights reserved.

Published by Cambridge University Press on behalf of *icipe*.