INSECT SCIENCE AND ITS APPLICATION

The International Journal of Tropical Insect Science

Editor-in-Chief
Thomas R Odhiambo
The International Centre of Insect Physiology and Ecology (ICIPE)

SPECIAL ISSUE

TROPICAL STEM BORERS OF GRAMINACEOUS CROPS: A NEW SYNTHESIS

Guest Editors: K. N. Saxena and K. V. Seshu Reddy

ICIPE SCIENCE PRESS

Insect Science and Its Application The International Journal of Tropical Insect Science

Sponsored by the International Centre of Insect Physiology and Ecology (ICIPE), and the African Association of Insect Scientists (AAIS)

Editor-in-Chief: Thomas R. Odhiambo Associate Editor: K. N. Saxena Scientific Editor: Serah W. Mwanycky

The International Centre of Insect Physiology and Ecology (ICIPE), P.O. Box 30772, Nairobi, Kenya

Editorial Advisory Board

F. T. Abushama, Kuwait, State of Kuwait

H. C. Agarwal, Delhi, India

J. Allen, Saskatoon, Canada

J. K. O. Ampofo, Arusha, Tanzania

A. Attygale, Ithaca, New York, USA

J. L. Auclair, Montreal, Canada

R. Galun, Jerusalem, Israel

I. Fagoonee, Reduit, Mauritius

K. M. Harris, London, UK

T. Hidaka, Kyoto, Japan

H. Hirumi, Nairobi, Kenya

A. G. Ibrahim, Serdang, Selangor, Malaysia

R. Kumar, Port Harcourt, Nigeria

V. M. Labeyrie, Paris, France

A. Mansingh, Kingston, Jamaica

F. G. Maxwell, College Station, Texas, USA

A. I. Mohyuddin, Rawalpindi, Pakistan

J. Mouchet, Paris, France

R. W. Mwangi, Nairobi, Kenya

L. M. Schoonhoven, Wageningen, The Netherlands

P. Singh, Auckland, New Zealand

K. Slama, Praha, Czechoslovakia

G. L. Teetes, College Station, Texas, USA

S. A. Toye, Ibadan, Nigeria

H. F. van Emden, Reading, UK

A. van Huis, Wageningen, The Netherlands

S. Yagi, Tsukuba, Ibaraki, Japan

PUBLISHED BIMONTHLY

Annual Subscription

For libraries, university departments, government laboratories, industrial and other multiple reader institutions (US\$ 180.00; 2-year rate (1990–1991) US\$ 360 (including postage and insurance), private individuals US\$ 75.00; 2-year rate US\$150.00. Specially Reduced Rates for Individuals: In the interest of maximizing the dissemination of the research results published in this important international journal we have established a two-tier price structure. Any individual whose institution takes out a library subscription may purchase a second or additional subscriptions for personal use at a much reduced rate of US\$ 65.00; 2-year rate US\$ 140.00. Members of the International Centre of Insect Physiology and Ecology (ICIPE) and the African Association of Insect Scientists (AAIS) may purchase a subscription at the special rate of US\$ 20.00.

Application forms for membership of the AAIS (subscription US\$ 20.00; 2-year rate US\$ 38.00) may be obtained from: Hon. Secretary, African Association of Insect Scientists, P.O. Box 59862, Nairobi, Kenya.

Prices are subject to amendment without notice

Copyright © 1990—ICIPE Science Press, The International Centre of Insect Physiology and Ecology

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying Information for users in the USA

The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided the stated fee for copying beyond that permitted by Section 107 or 108 of the U.S. Copyright Law, is paid. The appropriate remittance of \$3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

Permission for other use

The copyright owner's consent does not extend to copying for general distribution, for promotion for creating new works or for resale. Specific written permission must be obtained from the publisher of such copying.

The item-fee for this publication is 0191-9040/90 \$3.00+0.00

ICIPE SCIENCE PRESS P. O. Box 72913, Nairobi, Kenya, East Africa

SPECIAL ISSUE

TROPICAL STEM BORERS OF GRAMINACEOUS CROPS: A NEW SYNTHESIS

Proceedings of the First International Symposium on the Cereal Stem Borer *Chilo*

25-29 July 1989

Guest Editors: K. N. Saxena and K. V. Seshu Reddy

ICIPE SCIENCE PRESS

The International Journal of Tropical Insect Science

VOLUME 11 NUMBER 4/5

1990

CONTENTS

SPECIAL ISSUE

TROPICAL STEM BORERS OF GRAMINACEOUS CROPS: A NEW SYNTHESIS

T. R. ODHIAMBO	463	Foreword		
T. R. ODHIAMBO	465	Welcome Remarks		
K. M. HARRIS	467	Keynote Address: Bioecology of Chilo spp.		
STATUS AND CONTROL OF CHILO'SPP. IN DIFFERENT REGIONS				
S. Z. SITHOLE	481	Status and control of Chilo partellus Swinhoe (Lepidoptera: Pyralidae) in Southern Africa		
E. M. MINJA	489	Management of Chilo spp. infesting cereals in Eastern Africa		
F. P. NEUPANE	501	Status and control of Chilo spp. on cereal crops in Southern Asia		
C. S. LI	535	Status and control of <i>Chilo</i> spp., their distribution, host range and economic importance in Oceania		
V. MELAMED-MADJAR	541	Status of Chilo agamemnon Bles. in Israel and the probable reasons for the decrease in its populations		
TAXONOMY, DISTRIBUTION, POPULATION ECOLOGY, DYNAMICS AND				
CROP LOSSES				
K. V. SESHU REDDY, M. C. LUBEGA and K. O. S. SUM	549	Population patterns of <i>Chilo</i> spp. in sorghum, maize and millets		
K. KIRITANI	555	Recent population trends of Chilo suppressalis in temperate and sub-tropical Asia		
K. V. SESHU REDDY and P. T. WALKER	563	A review of the yield losses in graminaceous crops caused by <i>Chilo</i> spp.		
THOMAS R. ODHIAMBO	571	Special Lecture: Assets of an IPM specialist with particular reference to Chilo		

PHYSIOLOGY, BEHAVIOUR AND BIOCHEMISTRY

ŕ				
H. KANNO	579	Initiation mechanism of mating behaviour in the rice stem borer, Chilo suppressalis Walker		
H. C. AGARWAL, R. GUPTA, R. RATH and V. GOEL	583	Sterol inhibition in Chilo partellus		
S. M. WALADDE, H. M. KAHORO and S. A. OCHIENG'	593	Sensory biology of <i>Chilo</i> spp. with specific reference to <i>C. partellus</i>		
REARING AND QUALITY CONTROL				
S. L. TANEJA and K. F. NWANZE	605	Mass rearing of <i>Chilo</i> spp. on artificial diets and its use in resistance screening		
M. BETBEDER-MATIBET	617	Elevage de plusieurs especes du genre Chilo et de certains de leurs parasites pour la lutte biologique contre les foreurs des graminees en Afrique		
HOST PLANT RESISTANCE				
K. LEUSCHNER	627	A review of laboratory and field screening procedures for Chilo partellus		
M. N. UKWUNGWU	639	Host plant resistance in rice to the African striped borer, Chilo zacconius Bles. (Lepidoptera: Pyralidae)		
B. TORTO, A. HASSANALI and K. N. SAXENA	649	Chemical aspects of Chilo partellus feeding on certain sorghum cultivars		
BREEDING AND RESISTANCE GENETICS				
R. C. CHAUDHURY and G. S. KHUSH	659	Breeding rice varieties for resistance against <i>Chilo</i> spp. of stem borers in Asia and Africa		
B. L. AGRAWAL, S. L. TANEJA, L. R. HOUSE and K. LEUSCHNER	671	Breeding for resistance to Chilo partellus Swinhoe in sorghum		
M. ASHRAF and B. FATIMA	683	Breeding for resistance to Chilo spp. in sugar-cane		
R. S. PATHAK	689	Genetics of sorghum, maize, rice and sugar-cane resistance to the cereal stem borer, <i>Chilo</i> spp.		
CULTURAL, GENETIC AND CHEMICAL CONTROL				
K. V. SESHU REDDY	703	Cultural control of Chilo spp. in graminaceous crops		
V. A. O. OKOTH	713	Potential for the use of genetic methods for the control of <i>Chilo</i> spp.		

BIOLOGICAL CONTROL

A. I. MOHYUDDIN	721	Biological control of <i>Chilo</i> spp. in maize, sorghum and millet			
H. DAVID and S. EASWAR AMOORTHY	733	Biological control of Chilo spp. in sugar-cane			
D. J. GREATHEAD	749	Utilization of natural enemies of Chilo spp. for management in Africa			
LU QING GUANG and G. W. OLOO	757	Host preference studies on <i>Trichogramma</i> sp. nr mwanzai Schulten and Feijen (Hymenoptera: Trichogrammatidae) in Kenya			
J. W. BAHANA	765	Bioecological studies on <i>Dentichasmias busseolae</i> Heinrich and its potential for biological control of <i>Chilo partellus</i> Swinhoe			
M. O. ODINDO	773	Potential of <i>Nosema</i> spp. (Microspora: Nosematidae) and viruses in the management of <i>Chilo</i> spp. (Lepidoptera: Pyralidae)			
M. BROWNBRIDGE	779	The role of bacteria in the management of Chilo spp.			
PHEROMONAL CONTROL					
P. S. BEEVOR, H. DAVID and O. T. JONES	787	Female sex pheromones of <i>Chilo</i> spp. (Lepidoptera: Pyralidae) and their development in pest control applications			
G. C. UNNITHAN and K. N. SAXENA	795	Population monitoring of <i>Chilo partellus</i> (Swinhoe) (Lepidoptera: Pyralidae) using pheromone traps			
S. TATSUKI	807	Status of application of sex pheromone of rice stem borer moth, Chilo suppressalis in Japan			
INTEGRATED PEST MANAGEMENT					
E. A. AKINSOLA	815	Management of Chilo spp. in rice in Africa			
A. RAJABALEE	825	Management of <i>Chilo</i> spp. on sugar-cane with notes on mating disruption studies with the synthetic sex pheromone of <i>C. sacchariphagus</i> in Mauritius			
INTERNATIONAL CO-OPERATION AND TRAINING					
Z. M. NYIIRA	839	International co-operation and training for management of <i>Chilo</i> spp.			
Publisher's Announcement	844	Special Issue			
Instructions to Authors Author Checklist	i iv				