

# IOBC/wprs Bulletin Vol. 28(1) 2005

Working Group „Integrated Control in Protected Crops, Temperate Climate“,  
Proceedings of the meeting at Turku (Finland), 10 - 14 April 2005. Edited by:  
Annie Enkegaard. ISBN 92-9067-173-2 [xiii + 328 pp.]

Preface .....	i
Subject index .....	iii
Coexistence between <i>Trialeurodes vaporariorum</i> and <i>Bemisia tabaci</i> and impact of natural enemies in tomato crops under Mediterranean conditions <i>Judit Arnó, Montse Matas, Montse Martí, Jordi Ariño, Job Roig &amp; Rosa Gabarra</i> .....	1
Impact of interspecific interactions on inoculative biological control of leafminers <i>Amy Bader, Kevin Heinz &amp; Robert Wharton</i> .....	5
Application of non-chemical control of the slug <i>Lehmannia valentiana</i> Ferussac in Gerbera greenhouses in Iran <i>Valiollah Baniameri</i> .....	9
Developing an action threshold for the bulb mite, <i>Rhizoglyphus robini</i> on lily, onion and garlic <i>Tsliia Ben-David, Leah Tsrer &amp; Eric Palevsky</i> .....	11
Best Practice Guide for integrated pest and disease management on UK protected herbs <i>Jude Bennison, Kim Green &amp; Tim O'Neill</i> .....	15
Intraguild predation between <i>Orius majusculus</i> (Reuter) (Hemiptera: Anthocoridae) and <i>Iphiseius degenerans</i> Berlese (Acarina: Phytoseiidae) <i>Henrik F. Brødsgaard &amp; Annie Enkegaard</i> .....	19
IPM and biological control of protected cropping in some developing greenhouse regions <i>Vanda H.P. Bueno</i> .....	23
Control of western flower thrips with entomopathogenic nematodes, how does it work? <i>Rosemarie Buitenhuis &amp; Les Shipp</i> .....	27
Survey of aphids and their natural enemies on UK nursery stock <i>John Buxton, Jude Bennison &amp; Leslie Wardlow</i> .....	31
Demonstrating reduced-risk practices for control of important pests of <i>Gerbera jamsonii</i> grown as cut flower <i>V.L. Carne-Cavagnaro, K.L. Robb, S.A. Tjosvold, J.P. Newman &amp; M.P. Parrella</i> .....	35
Thrips (Thysanoptera) in protected rose crops in Brazil <i>Alessandra R. Carvalho, Vanda H.P. Bueno &amp; Alexandre J.F. Diniz</i> .....	39
Response of two <i>Orius</i> species to temperature <i>Livia M. Carvalho, Vanda Helena P. Bueno &amp; Simone M. Mendes</i> .....	43
Companion plants for ornamental nursery stock conservation biological control programs <i>Christine Casey</i> .....	47
Effects of repeated applications of an azadirachtin-based product on the spider mite <i>Tetranychus urticae</i> and its phytoseiid predator <i>Neoseiulus californicus</i> <i>Marisa Castagnoli, Roberto Nannelli &amp; Sauro Simoni</i> .....	51
Artificial diets for rearing predatory mirid bugs <i>Cristina Castañé &amp; Rafael Zapata</i> .....	55
A “bottom up” approach to managing western flower thrips on potted mums <i>Amanda Chau, Kevin M. Heinz &amp; Fred T. Davies, Jr.</i> .....	59
Manipulation of sex ratios in mass rearing of <i>Diglyphus isaea</i> (Walker), an ectoparasitoid of agromyzid leafminers <i>Andrew Chow &amp; Kevin M. Heinz</i> .....	63
IPM programs in tomatoes resistant to TYLCV in Israeli screen-houses <i>Raisa Chyzik, Yoel Mesika, Miri Tregerman, Sophia Kleitman &amp; A. Rami Horowitz</i> .....	67
Impact of biological and behavioural variation in spider mites (Acari: Tetranychidae) on the success of IPM of UK tomato crops <i>Pat Croft, Rob Jacobson &amp; John Fenlon</i> .....	71
Spruce spider mite ( <i>Oligonychus ununguis</i> Jacobi) and its predators associated with ornamental coniferous plants in Polish nurseries <i>Barbara Czajkowska &amp; Puchalska Ewa</i> .....	75
Persistence of <i>Wolbachia</i> in the guts of the predatory mite <i>Phytoseiulus persimilis</i> <i>Monika Enigl &amp; Peter Schausberger</i> .....	79
Interspecific interactions among the aphid parasitoid <i>Aphidius colemani</i> and the aphidophagous gallmidge <i>Aphidoletes aphidimyza</i> <i>Annie Enkegaard, Rikke Kirkeløkke Christensen &amp; Henrik F. Brødsgaard</i> .....	83
Dynamic climate control strategies influence pests and beneficials <i>Annie Enkegaard &amp; Henrik F. Brødsgaard</i> .....	87
Voracity of larvae of three hoverfly species (Dip.: Syrphidae) as potential biological control agents of <i>Myzus persicae</i> (Hom.: Aphididae) on greenhouse crops <i>Yaghoub Fathipour, Farzad Jalilian, Ali Asghar Talebi &amp; Saeid Moharrampour</i> .....	91
Novel isolates of the entomopathogenic fungus <i>Beauveria bassiana</i> for biological control of the shore fly, <i>Scatella tenuicosta</i> <i>Melanie Filotas, Louela Castrillo, John Vandenberg, John Sanderson &amp; Stephen Wraight</i> .....	95
An investigation on biological control of the tomato russet mite <i>Aculops lycopersici</i> (Masse) with <i>Amblyseius andersoni</i> (Chant) <i>Serge Fischer, Françoise Klötzli, Léia Falquet &amp; Olivier Celle</i> .....	99
New fungi to control Phytophagous mites and Phytophatogenic fungi <i>Uri Gerson, Zahi Paz, Lior Kushnir &amp; Abraham Szejnberg</i> .....	103

Development of new fungal biopesticides for the Australian greenhouse industry <i>Stephen Goodwin, Marilyn Steiner &amp; Weiguang Liang</i> .....	107
Possibilities to manipulate direct and indirect chemical defence of the crop plants – benefits and drawbacks for IPM <i>Jarmo K. Holopainen</i> .....	111
APHCON - Computer based decision-aid for optimising biological control of aphids in greenhouses <i>Martin Hommes &amp; Dieter Gebelein</i> .....	115
Biological control of the tobacco whitefly <i>Bemisia tabaci</i> with the predatory mite <i>Amblyseius swirskii</i> in sweet pepper crops <i>Hans Hoogerbrugge, Javier Calvo, Yvonne van Houten &amp; Karel Bolckmans</i> .....	119
AYR salad production: the driving forces and potential impact on IPM <i>Rob Jacobson</i> .....	123
The influence of a dynamic climate on pests, diseases and beneficial organisms: recent research <i>Lene Jakobsen, Michael Brogaard, Oliver Körner, Annie Enkegaard &amp; Jesper M. Aaslyng</i> .....	127
Compatibility of <i>Atheta coriaria</i> with other biocontrol agents used in greenhouse production <i>S. Jandricic, G. Murphy, B. Broadbent, C. Scott-Dupree &amp; R. Harris</i> .....	135
Toxicity of soil applied pesticides to <i>Atheta coriaria</i> Kraatz <i>S. Jandricic, C. Scott-Dupree, R. Harris, B. Broadbent &amp; G. Murphy</i> .....	139
Optimal concentration of <i>Beauveria bassiana</i> as vectored by bumblebees for pest control on sweet pepper <i>Jean Pierre Kapongo, Les Shipp, Peter Kevan &amp; Bruce Broadbent</i> .....	143
Some natural enemies of Eriophyid mites from Western Iran <i>M. Khanjani &amp; M. Mirab Balou</i> .....	147
Effect of different cucumber cultivar hybrids <i>Cucumis sativus</i> on developmental time, fecundity and intrinsic rate of increase ( $r_m$ ) of <i>Tetranychus urticae</i> Koch <i>Neda Kheradpir, Jafar Khalghani, Hadi Ostovan &amp; Mohammad Reza Rezapannah</i> .....	151
The potential of the parasitoid <i>Chrysonotomyia formosa</i> for controlling the tomato leafminer <i>Liriomyza bryoniae</i> in Dutch tomato greenhouses in winter <i>J. Klapwijk, E. Sanchez Martinez, H. Hoogerbrugge, M. den Boogert &amp; K. Bolckmans</i> .....	155
Attraction of the monoterpenoids nerol and carvacrol to the predatory flower bug <i>Orius laevigatus</i> (Fieber) <i>Christian Kornherr &amp; Sylvia Blümel</i> .....	159
Side effects of the monoterpenoids nerol and carvacrol on the predatory flower bug <i>Orius laevigatus</i> (Fieber) in the laboratory <i>Christian Kornherr, Hermann Hausdorf &amp; Sylvia Blümel</i> .....	163
<i>Thripinema nicklewoodi</i> performance against <i>Frankliniella occidentalis</i> in a chrysanthemum production system <i>Peter C. Krauter, Steven Thompson &amp; Kevin M. Heinz</i> .....	167
The potential of native phytoseiid species for the control of spider mites on lindens in nurseries <i>Danuta Kropczyńska-Linkiewicz, Bartosz Kaźmierczak &amp; Julia Górecka</i> .....	171
Biological control of greenhouse whitefly ( <i>Trialeurodes vaporariorum</i> ) on interplanted tomato crops with and without supplemental lighting using <i>Dicyphus hesperus</i> (Quebec, Canada) <i>Liette Lambert, Thierry Chouffot, Gilles Turcotte, Martial Lemieux &amp; Jocelyne Moreau</i> .....	175
Regulation of invertebrate biological control agents: international context and situation in The Netherlands <i>Antoon Loomans &amp; Susanne Sütterlin</i> .....	179
<i>Typhlodromips swirskii</i> (Athias-Henriot) (Acari: Phytoseiidae): a new predator for thrips control in greenhouse cucumber <i>Gerben Messelink, Sebastiaan van Steenpaal &amp; Wim van Wensveen</i> .....	183
Evaluation of susceptibility of <i>Trialeurodes vaporariorum</i> (Hom: Aleyrodidae) to pyriproxyfen and buprofezin <i>Saeid Moharramipour, Ahmad Heidari, Ali Asghar Talebi, Ali Asghar Pourmirza &amp; Yaghoub Fathipour</i> .....	187
New hosts of <i>Phytophthora ramorum</i> in Poland: occurrence and plant colonisation <i>Leszek B. Orlikowski</i> .....	191
Flower bugs of the genus <i>Orius</i> Wolff (Heteroptera: Anthocoridae) from Iran and feeding rate of predatory bug <i>Orius albidipennis</i> (Reuter) under laboratory conditions <i>Hadi Ostovan &amp; Ali Mirhelli</i> .....	195
Effect of abamectin on the leafminer parasitoid <i>Diglyphus isaea</i> <i>Michael P. Parrella &amp; Roy Kaspi</i> .....	197
<i>Franklinothrips vespiformis</i> (Thysanoptera: Aeolothripidae): biology on two preys <i>Leonardo S. R. Pierre, Vanda H. P. Bueno &amp; Luís Cláudio P. Silveira</i> .....	201
Biocontrol of the greenhouse whitefly, <i>Trialeurodes vaporariorum</i> with the predatory mite <i>Euseius ovalis</i> in cut roses <i>J. Pijnakker</i> .....	205
Can integrated pesticides improve biological control of <i>Bemisia tabaci</i> in <i>Euphorbia pulcherrima</i> ? <i>Ellen Richter</i> .....	209
Biological control in strawberry in Japan <i>Yoko Saiki &amp; Tetsuo Wada</i> .....	213
Co-occurrence of <i>Aphidius colemani</i> and other aphid parasitoids in some localities of Southeastern Brazil <i>Marcus V. Sampaio, Vanda H.P. Bueno, Bruno B.F. De Conti, Sandra M.M. Rodrigues &amp; Maria C.M. Soglia</i> .....	217
Preference assessment of two <i>Orius</i> spp. for <i>Neoseiulus cucumeris</i> vs. <i>Frankliniella occidentalis</i> <i>John P. Sanderson, Henrik F. Brodsgaard &amp; Annie Enkegaard</i> .....	221
Binomial count sampling for western flower thrips in greenhouses <i>J. Sanderson, J. Nyrop, L. Shipp, T. Ugine, S. Wraight &amp; K. Wang</i> .....	225
Biology and predatory feeding behavior of larvae of the hunter fly <i>Coenosia attenuata</i> <i>Emily J. Sensenbach, Stephen P. Wraight &amp; John P. Sanderson</i> .....	229
Rearing of predator bug <i>Orius laevigatus</i> (Fieb.) (Heteroptera, Anthocoridae) with alternative food and its application against <i>Frankliniella occidentalis</i> (Pergande) <i>Anna Shchenikova &amp; Elena N. Stepanycheva</i> .....	233
Effect of host plant on control of <i>Tetranychus urticae</i> by <i>Verticillium (Lecanicillium) lecanii</i> <i>Margarita Shternshis, Irina Andreeva &amp; Marina Trandysheva</i> .....	237
Fertility life table of <i>Aphis gossypii</i> on three commercial chrysanthemum cultivars <i>Maria da Conceição de M. Soglia, Vanda Helena P. Bueno &amp; Marcus V. Sampaio</i> .....	241

Managing tomato russet mite, <i>Aculops lycopersici</i> (Masse) (Acari: Eriophyiidae) in greenhouse tomato crops <i>Marilyn Steiner &amp; Stephen Goodwin</i> .....	245
Compatibility of two formulations of bifentazate with <i>Phytoseiulus persimilis</i> Athias-Henriot (Acari: Phytoseiidae) <i>Marilyn Steiner &amp; Stephen Goodwin</i> .....	249
Effects of selected fungicides on a Mycophagous Ladybird (Coleoptera: Coccinellidae): Ramifications for biological control of powdery mildew <i>Andrew M. Sutherland</i> .....	253
Future greenhouse technologies and their impact on pest management <i>Risto Tahvonen</i> .....	257
Eulophid parasitoids of agromyzid leafminers genus <i>Liriomyza</i> (Dip.: Agromyzidae) in Tehran, Iran <i>Ali Asghar Talebi, Rahil Asadi, Yaghoob Fathipour, Karim Kamali, Saeid Moharrampour &amp; Ehsan Rakhshani</i> .....	263
Behaviour and activity of <i>Phytoseiulus persimilis</i> (A.-H.) on mite infested cucumber plants cultivated in the presence of plant growth promoting rhizobacteria (PGPR) <i>Anna Tomczyk &amp; Wioletta Burda</i> .....	267
Differential susceptibility of western flower thrips ( <i>Frankliniella occidentalis</i> ) to <i>Beauveria bassiana</i> , as a function of host plant species <i>Todd A. Ugine, Stephen P. Wraight &amp; John P. Sanderson</i> .....	271
Progress with IPM on nurseries in the Netherlands <i>Anton van der Linden &amp; Frank Nouwens</i> .....	275
Augmentation of predatory mites in Dutch nursery stock <i>Anton van der Linden &amp; Frank Nouwens</i> .....	279
Biological control of western flower thrips on sweet pepper using the predatory mites <i>Amblyseius cucumeris</i> , <i>Iphiseius</i> <i>degenerans</i> , <i>A. andersoni</i> and <i>A. swirskii</i> <i>Yvonne M. van Houten, Mai Linn Østlie, Hans Hoogerbrugge &amp; Karel Bolckmans</i> .....	283
Risk assessment: what happened after Victoria, Canada 2002? <i>Joop C. van Lenteren</i> .....	287
The biology of the brown lacewing <i>Micromus variegatus</i> (Neuroptera: Hemerobiidae) and its possible use against the aphid <i>Aulacorthum solani</i> in sweet pepper <i>Jeroen van Schelt, Evangelos Pelekanis &amp; Karel Bolckmans</i> .....	291
Artificial lighting (AL) and IPM in greenhouses <i>Irene Vänninen &amp; Nina Svae Johansen</i> .....	295
Importance of registration and patenting of biological control agents <i>Tetsuo Wada</i> .....	305
Are two better than one? Combined effects of the predatory mites <i>Phytoseiulus persimilis</i> and <i>Neoseiulus californicus</i> (Acari: Phytoseiidae) on spider mite control <i>Andreas Walzer &amp; Peter Schausberger</i> .....	309
Diel movement of predatory mites ( <i>Neoseiulus cucumeris</i> ), reared in light or dark, on greenhouse sweet pepper <i>Phyllis Weintraub, Sophia Kleitman &amp; Eric Palevsky</i> .....	313
Need for new biocontrol agents in greenhouse IPM - a European perspective <i>Phyllis Weintraub &amp; Sharon Cheek</i> .....	317
Influence of light on the efficacy of biological control agents in glasshouse environments <i>Gabriella M.G. Zilahi-Balogh, J.L. Shipp, C. Cloutier &amp; J. Brodeur</i> .....	325