Organización Internacional para el Control Biológico de Animales y Plantas Perjudiciales (IOBC)
Organização Internacional para o Controle Biológico de Animais e Plantas Nocivos (IOBC)
International Organization for Biological Control of Noxious Animal and Plants (IOBC)

Sección Regional Neotropical (SRNT)
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1. EDITORIAL: THE OLD AND FAITHFUL COMPARED MORPHOLOGY: YOUNGER THAN EVER?

The current proliferation and economy of molecular techniques has made them of routinary use in many biological studies. In pest biocontrol particularly, said techniques have become almost indispensable for defining such things as the place of origin of a pest and/or its natural enemies, their host race, the subspecific taxon or phylogeny of a pest or its natural enemies, the diet composition of an organism, or the presence of pathogens or parasitoids in it. In addition, molecular techniques can help us characterize organisms in situations where determining with any certainty the species involved is almost impossible. This can be due to a variety of reasons, such as coming across cryptic species, undescribed species, species belonging to taxa that require complete revisions, or even a lack of a specialist in a given group. Moreover, in some cases the mere concept of species lacks practical use inasmuch as the specificity or utility of a biocontrol agent comes defined by categories well below species, in one or both components of a pest-natural enemy system. Yet, doing without a species determination is always unstable, always undefined, and always short-lived. Biology as we know it still leans on the traditional Linnaean system and compared morphology, at least for multicellular organisms. The obstacles we find every time we lack a genus and species identification certified by a specialist are many: for example regulations for the movement and introduction of organisms demand positive identifications; literature searches are complicated and risk being fragmentary without the full identity of the organisms under study; it is also difficult to publish without them, or the publication retains an awkward air of incompleteness. Also, the literature is teeming with studies where molecular techniques and compared morphology complement each other in such a way that their interdependence becomes unavoidable. However, while molecular techniques become more and more common, and more and more scientists become familiarized with their use and interpretation, taxonomists are a dying race. This is caused by a series of linked factors that form a vicious circle: taxonomy demands a time of professional learning, patience, and encyclopaedic knowledge that modern science does not seem willing to support; also, the new generations of scientists are naturally inclined toward more glamorous and better budgeted disciplines; in addition, a great part of the financial and administrative decisions are not necessarily taken by prepared scientists, or these are cornered by commercial considerations that also deviate them to better promoted scientific areas; finally, there is a generalized ignorance among professionals and laymen alike of the importance of keeping well prepared taxonomy teams. As obtaining reliable identifications and species descriptions becomes harder, and our studies limp at their taxonomic leg, it is growingly apparent that we must stimulate the training of more people in systematics and taxonomy by every means possible: emphatically publicized in our classes, promoting the inclusion of systematic subjects in student's study plans, including taxonomists in our publications, and ensuring within our powers as administrators or consultants, their financial resources.

2. THE NEW WEBPAGE OF THE IOBC/NTRS

The IOBC-NTRS webpage is active right now at: www.lef.esalq.usp.br/iobc-ntrs

At the moment it is in Portuguese and English, but the Spanish version is under construction.

We need your contributions to make it work, so they are more than welcome: they are STRONGLY ENCOURAGED!

The articles of this and other newsletters will also be uploaded.

3. MEMBERSHIP FEES

The IOBC fees for the NTRS for the 2008-2009 period remain as last year at 20 U$S .

We remind you that becoming a member would give you, among other benefits:

- Free access to specific information at the IOBC internet site
- Free access to online IOBC publications
- Free participation in the Global Writing Partnership
- Important discounts for proceedings, workshops and meetings
- 75% discount in publication fees for the journal biocontrol (the successor of the prestigious ENTOMOPHAGA)
- Discounts on the journal Biocontrol, and Science and Technology

For more information please visit our website: http://www.unipa.it/iobc/

As for Institutional memberships, IOBC Global is currently re-evaluating membership fees, however, in the mean time, it is Euros 200, and it includes a BioControl subscription.

4 IOBC-GLOBAL WRITING PARTNERSHIP

For starting scientists not born in an English speaking country, it appears often difficult and frustrating to prepare an article for a leading biological control journal. Some "starters" either have easy access to an English speaking colleague, or have funds available for translation and correction, but others do not have these possibilities.

Our concept is to help young IOBC members (<35 years) from developing countries where English is not the first language and who are the first author of an article, one time with the writing of a research paper. If you need help or if would like to assist one time in this IOBC partnerships for writing articles, please contact Joop.vanLenteren@wur.nl

5. WORKING GROUPS OF IOBC GLOBAL

WORK GROUP ORGANIZATION

As we expressed in the editorial, Work Groups are the heart of the NTRS. The WGs have the objective of bringing together three or more NTRS members who share a common interest in a field of biocontrol to exchange ideas, experience, literature and research projects. Once we organize a group we will propose a monthly appointment to

chat and interact more directly. To begin with I propose the creation of the following WG: Biocontrol of white flies, Egg parasitoids, Entomopathogens, Mass rearing and quality control, Biocontrol agents trade, Biocontrol and conservation, Biocontrol of Crambidae. However, feel free to suggest different WG, according to your experience or field of interest.

I invite you to send me an e-mail specifying your WG of choice and willingness to coordinate it.

You are all welcome to take part in the NTRS's WGs.!!!

Maria Manzano
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Information provided below about working groups is limited, most information is regularly updated on our website and the websites of the working groups.

WG ARTHROPOD MASS-REARING AND QUALITY CONTROL

Convenors: Dr. S. Grenier, UMR INRA/INSA de Lyon, Biologie Fonctionnelle, Insectes et Interactions (BF2I), INSA, Bâtiment Louis Pasteur, 20 av. A. Einstein, 69621 Villeurbanne Cedex, France. Tel: +33 (0)4 72 43 79 88. Fax: +33 (0)4 72 43 85 34. Email: sgrenier@jouy.inra.fr. Dr. N.C. Leppla, University of Florida, Institute of Food and Agricultural Sciences, Department of Entomology and Nematology, Gainesville, Florida, USA. Email: ncl@gnv.ifas.ufl.edu. Dr. P. De Clercq, Laboratory of Agrozoology, Department of Crop Protection, Faculty of Bioscience Engineering, Gent University, Belgium. Email: Patrick.DeClercq@ugent.be

See website for future activities: http://users.ugent.be/~padclerc/AMRQC/contacts.htm. Next meeting of the WG is planned for OCTOBER 2007 in Canada

WG BIOLOGICAL CONTROL OF APHIDS / APHIDOPHAGA

Convenors: Dr. N. G. Kavallieratos (Greece) G. Laboratory of Agricultural Entomology, Department of Entomology and Agricultural Zoology, Benaki Phytopathological Institute, 8 Stefanou Delta, 14561, Kifissia, Attica, Greece; Email: nick_kaval@hotmail.com, Eric Lucas (Canada), J.P. Michaud (USA

Next meeting will be in Athens, Greece from 5-10 September 2007: see http://www.aphidophaga10.gr/

WG BIOLOGICAL CONTROL OF CHROMOLAENA ODORATA (SIAM WEED)

New Converor: Dr. Costas Zachariades, ARC-PPRI, Private Bag X6006, Hilton, 3245 South Africa; Tel 033-3559418, cell 0833152100, fax 033-3559423; ZachariadesC@arc.agric.za. The previous convenor, Dr. R. Muniappan, receives IOBC's great respect and compliments for all his activities in IOBC, both in the APRS Regional Section and for this Working Group! Without persons like him, IOBC would not be able to function.

The Seventh International Workshop on Biological Control and Management of Chromolaena and Mikania was held in Taiwan last September 2006 and proceeded very

well as expected. Dr. Po-Yung Lai of National Pingtung University of Science and Technology hosted the workshop.

See website for future activities/newsletter:
http://www.ehs.cdu.edu.au/chromolaena/siamhome.html

WG BIOLOGICAL CONTROL OF PLUTELLA

Convenors: Dr. A.M. Shelton, Department of Entomology, Cornell University, New York State Agricultural Experimenta Station, 416 Barton Lab Geneva, NY 14456, USA. Tel: +1-315-787-2352. Fax: +1-315-787-2326. Email: ams5@cornell.edu. Dr. A. Sivapragasam, Strategic, Environment and Natural Resources Centre, MARDI, Kuala Lumpur, Malaysia. Email: sivasam@mardi.my. Dr. D.J. Wright, Department of Biology, Imperial College at Silwood Park, Ascot, Berkshire, UK. Email: d.wright@ic.ac.uk
See website for future activities: http://www.nysaes.cornell.edu/ent/dbm/

WG BIOLOGICAL CONTROL OF WATER HYACINTH

Chairman: Dr Martin Hill, Department of Zoology and Entomology, Rhodes University, P.O. Box 94, Grahamstown, 6140, South Africa. m.p.hill@ru.ac.za

WG EGG PARASITOIDS

Convenors: Prof.dr. F. Bin, Department of Arboriculture and Plant Protection, University of Perugia, Borgo XX Giugno, 06121 Perugia, Italy. Tel: +39-075-585-6030. Fax: +39-075-585-6039. Email: fbin@unipg.it. Dr. E. Wajnberg, Ecologie Comportementale, I.N.R.A., Sophia Antipolis, France. Email : wajnberg@antibes.inra.fr. Dr Guy Boivin, Research Station, Agriculture Canada, St-Jean-sur-Richelieu, Québec, Canada. Email: boiving@agr.gc.ca

The next meeting of this working group is planned during the International Congress of Entomology in Durban, South Africa (2008)

WG FRUIT FLIES OF ECONOMIC IMPORTANCE

hairman: Dr. B.A. McPheron, Dept. Entomology, 501 ASI Bldg., Pennsylvania State University, Univ. Park, PA 16802, USA. Tel: +1-814-865-3088. Fax: +1-814-856-3048.Email: bam10@psu.edu

WG IWGO – OSTRINIA AND OTHER MAIZE PESTS (BY H. BERGER)

Convenors: Ulrich Kuhlmann; CABI-BioScience; Head Agricultural Pest Research CABI Bioscience Switzerland Centre, Delémont; Switzerland, Email: u.kuhlmann@cabi.org. C. Richard Edwards; Purdue University; Dep. of Entomology; Indiana; USA; Email: richedwards@entm.purdue.edu. Harald K. Berger; AGES, Spargelfeldstraße 191; 1226 Wien; Austria; Tel.: # 43 /664/56-42-885. Fax: # 43/1/732-16-2106. Email: harald.berger@ages.at.

All relevant data, reports and future meetings are published on the IWGO website: http://www. iwgo.org

GLOBAL WG ON TRANSGENIC ORGANISMS IN IPM AND BIOCONTROL

Convenors: Dr. Angelika Hilbeck, Swiss Fed. Inst. of Technology, Geobotanical Institute, Zurichbergstr. 38, CH-8044,Zurich. Tel: +41 (0) 1 632 4322. Fax:+ 41 (0) 1 632 1215. Email: angelika.hilbeck@env.ethz.ch. Dr. Salvatore Arpaia, Italy. Email: arpaia@trisaia.enea.it. Dr. Nick Birch, UK. Email: n.birch@scri.sari.ac.uk. Dr Gabor Lovei, Denmark. Email: gabor.lovei@agrsci.dk;

The WG organised the Workshop "Environmental Risk Assessment of GM plants: discussion for consensus" in Rotondella, Italy, from 6-9 June 2006, in cooperation with ENEA (Italian National Agency for New Technologies, Energy and Environment). A short report of this meeting, including a picture of the participants can be found in newsletter 80.

6. REGIONAL REPRESENTATIVES OF THE NTRS

WE ARE LOOKING FOR VOLUNTEERS TO COVER THE POST OF REPRESENTATIVES FOR THE NTRS.

The Regional Representatives of the NTRS represent the Directive Board (DB) of the IOBC-NTRS in her/his country, and has the following duties:

- Send information for the biannual Newsletter (see annex below)
- Promote the goals of the organization through an active presence in scientific séances by means of communications, posters, brochures, etc.
- Promote memberships and charge the societal fees in the name of the NTRS.
- Inform the DB in December about the annual activities.

Information required from a Representative of the NTRS

- News on meetings, congresses, courses and symposia related to BC (name of the event, date and location, contact information)
- Brief summaries (ca. 60 words) on such meetings, and information on how to get proceedings or abstract books.
- Prizes and honours awarded to our members.
- New books, and book reviews.
- Ads on biological material wanted and offered.
- Brief (30 words) summaries of new biocontrol projects and other pertaining information.

This designation will be renewed every 1st of January, if you are willing.

7. COURSES, WORKSHOPS AND MEETINGS

Financial Assistance Available for Young IOBC Members to Attend the 23rd IWGO Conference, Munich, Germany, April 5 to 8, 2009

Dear Colleagues,

IOBC Global - IWGO has funds to provide financial assistance for young IOBC members (< 35 years of age) to attend the 23rd IWGO Conference, Munich, Germany, 5 to 8 April 2009. As much as 500 Euro per person will be available for a limited number of participants. One must present a paper or poster to receive these funds (see "Call for Papers" at http://www.iwgo.org/munich2009/ for submitting titles). Those interested in applying for funds should send an e-mail to conference@iwgo.org before 15 February 2009, and provide the following information as requested in the attachment.

The Organizing Committee

International Working Group of Ostrinia and other Maize Pests
A Global IOBC Working Group
The 23rd IWGO Conference will take place Munich, Germany
April 5 to 8, 2009
E-mail: conference@iwgo.org
Website: http://www.iwgo.org/

2nd Biocontrol Symposium of Chile

The 2nd Biocontrol Symposium of Chile "Changes and Opportunities" will be held in Chillán (400 km south of Santiago) from May 12 to 15. The symposium will be organized by the Centro Tecnológico de Control Biológico del Instituto de Investigaciones Agropecuarias (INIA Quilamapu)- and will deal with weed and pest biocontrol in agriculture and urban areas, using virus, fungi, nematodes, insects and mites. Other subjects, like molecular and biotechnological techniques, ecology and semiochemicals will also be treated.

Scarabaeology meeting, VIII RELAS, in México 2009

The webpage for this meeting is active already. Please visit

http://www-museum. unl.edu/research /entomology/ RELAS/Mexico- 2009/Mexico. html

8. BIOCONTROL PROYECTS IN THE NTRS

· **Silva, R.J.; Bueno, V.H.P.; SAMPAIO, M. V.** Qualidade de diferentes espécies de pulgões como hospedeiros do parasitóide *Lysiphlebus testaceipes* (Cresson) (Hymenoptera: Braconidae, Aphidiinae). Neotropical Entomology, v. 37, p. 173-179, 2008. [Quality of different aphids as hosts of the parasitoid *Lysiphlebus testaceipes* (Cresson) (Hymenoptera : Braconidae, Aphidiinae)]

Lysiphlebus testaceipes (Cresson) has a broad aphid host range; however the quality of these preys may interfere in its biological feature. This study aimed to evaluate the quality of three Macrosiphini, *Brevicoryne brassicae* (L.), *Lipaphis erysimi* (Kaltenbach) and *Myzus persicae* (Sulzer), and three Aphidini *Schizaphis graminum* (Rondani) *Rhopalosiphum maidis* (Fitch) and *Aphis gossypii* Glover as hosts to *L. testaceipes* and to determine the relation possible of host preference, of size and quality of the host. The tests were carried out in climatic chamber at 25 ºC, RH 70 +/- 10% and 12h photophase. The parasitoid did not oviposite in *B. brassicae* and *L. erysimi*, while

the other species were nutritionally suitable to the parasitoid. *L. testaceipes* showed preference for aphids from tribe Aphidini and these hosts presented better quality to the parasitoid when compared to Macrosiphini. Interactions among size, preference and quality between the Aphidini were found. *L testaceipes* showed preference (parasitism rate 76.7%) for *R. maidis*, the bigger host (hind tibia with 0.281 mm). This host provided bigger size (hind tibia with 0.49 mm) and higher emergence rate (95.6%) to the parasitoid when compared to *A. gossypii* (parasitism rate of 55.7%). Also the smaller host *A. gossypii* (0.266 mm) provided smaller size hind tibia (0.45 mm) and higher mortality of the parasitoid (emergence rate 72.1%). However, the development time was shorter and the longevity was higher in *A. gossypii* (6.3 and 5.4 days, respectively) when compared to the host *R. maidis* (6.7 and 3.8 days, respectively), and not been related to host size.

· **Silva, R.J.; Bueno, V.H.P.; Silva, D. B.; SAMPAIO, M. V.** Tabela de vida de fertilidade de *Lysiphlebus testaceipes* (Cresson) (Hymenoptera, Braconidae, Aphidiinae) em *Rhopalosiphum maidis* (Fitch) e *Aphis gossypii* Glover (Hemiptera, Aphididae). Revista Brasileira de Entomologia, v. 52, p. 124-130, 2008. [Fertility life table of *Lysiphlebus testaceipes* (Cresson) (Hymenoptera, Braconidae, Aphidiinae) in *Rhopalosiphum maidis* (Fitch) and *Aphis gossypii* Glover (Hemiptera, Aphididae)]

The evaluation of the growth potential of *Lysiphlebus testaceipes* (Cresson) is important for its use in biological control programs of aphids. This work aimed to evaluate the fertility life table of *L. testaceipes* in *Rhopalosiphum maidis* (Fitch) and *Aphis gossypii* Glover. To determine the immature mortality, development and the sex ratio of the parasitoid, 12 females parasitoid, and 480 nymphs of each aphids were used. To evaluate the longevity and fertility 15 female parasitoid were used. Nymphs of each aphid (3 day old) were offered for each parasitoid female daily, until the female died, being 300 (1st day); 250 (2nd) day); 200 (3rd) day); 150 (4th) day) and 50 nymphs in the other days. *L. testaceipes* showed immature mortality rates of 5.6 % in *R. maidis* and 9.2 % in *A. gossypii*. The development time of *L. testaceipes* in *R. maidis* and *A. gossypii* was 10.2 and 10.1 days, and the sex ratio of 0.71 and 0.66, respectively. The female of *L. testaceipes* had a fecundity of 498.8 eggs in *R. maidis* and 327.8 eggs in *A. gossypii*. The growth parameters the *L. testaceipes* in *R. maidis* and *A. gossypii* were, respectively Ro= 205.38 and 164.08 females; rm= 0.449 and 0.431 females/females/day; e= 1.57 and 1.54 females/day; T= 11.86 and 11.83 days and TD= 10.78 and 11.27 days. *L. testaceipes* showed great growth potential on both aphid hosts. *R. maidis* could be a suitable host for proposals of mass-rearing and open rearing system using *L. testaceipes*.

· **SAMPAIO, M. V.; Bueno, V.H.P.; De Conti, B.F.** The efect of the quality and size of host aphid species on the biological characteristics of *Aphidius colemani* (Hymenoptera: Braconidae, Aphidiinae). European Journal of Entomology, v. 115, p. 489-494, 2008.

A suitable host provides, at least, the minimum nutritional and physiological conditions for the development of the immature stages of a parasitoid. Host quality may influence the developmental time, mortality rate, longevity and fecundity of parasitoids. This work evaluates the suitability and quality of *Aphis gossypii* Glover, *Brevicoryne brassicae* (Linné), *Myzus persicae* (Sulzer), *Rhopalosiphum maidis* (Fitch) and *Schizaphis graminum* (Rondani) as hosts for *Aphidius colemani* Viereck. Twenty

second-instar nymphs of each aphid species were exposed to parasitism for one hour, and then kept in a climatic chamber at 22 ± 1°C, 70 ± 10% RH and a 12 h photophase. The aphid *B. brassicae* was unsuitable for the development of *A. colemani*. The different aphid host species varied in size: *M. persicae* > (*R. maidis* = *S. graminum*) > *A. gossypii*. Parasitoid fitness decreased accordingly when reared on (*M. persicae* = *R. maidis)* > *S. graminum* > *A. gossypi*i. Large hosts seem to be better than small hosts based on parasitoid size. Egg load of *A. colemani* was related probably more on the ability of the parasitoid larva to obtain nutritional resources from the different host species than on host size.

· **De Conti, B.F.; Bueno, V.H.P.; SAMPAIO, M. V.** The parasitoid *Praon volucre* (Hymenoptera: Braconidae, Aphidiinae) as a potential biological control agent of the aphid *Uroleucon ambrosiae* (Hemiptera: Aphididae) on lettuce in Brazil. European Journal of Entomology, v. 105, p. 485-487, 2008.

The aphid *Uroleucon ambrosiae* (Thomas) is one of the principal pests found on greenhouse lettuce crops, and there is no efficient biological control agent of this pest in Brazil. This work evaluates the aphid *U. ambrosiae* as a host for the parasitoid *Praon volucre* (Haliday), aimed at using *P. volucre* as a potential biological control agent of *U ambrosiae* on lettuce. As *Macrosiphum euphorbiae* (Thomas) is a common host of *P. volucre* in the field, the development of the parasitoid was compared on these two aphid species. Twenty nymphs of the 2nd instar were kept with *P. volucre* for one hour at 22 ±1 degrees C, 70 ± 10% RH and a 12 h photophase. The size of the aphid's tibiae at the moment of oviposition indicated that there was no significant size difference between *U. ambrosiae* (0.6 ± 0.02 mm) and *M. euphorbiae* (0.7 ± 0.03 mm). When mummies were formed, *M. euphorbiae* had significantly longer tibia (1.5 ± 0.03 mm) than *U. ambrosiae* (1.4 ± 0.02 mm). No significant differences were detected in the percentage emergence (74.9 ± 7.92 and 87.5% ± 3.31 for U. ambrosiae and *M. euphorbiae*, respectively), or proportion of female offspring (56.2 ± 7.62 and 44.2 ± 7.14%). The development time from oviposition to adult and longevity of females and males of *P. volucre* reared on the two host species were not different. High parasitism levels were recorded for both host aphid species, but the percentage parasitism of *M. euphorbiae* (54.4 ± 4.40) was higher than of *U. ambrosiae* (35.6 ±5.30). Female parasitoids reared on *M. euphorbiae* had longer tibiae (0.78 ± 0.01 mm) than those reared on *U. ambrosiae* (0.72 ± 0.01 mm). Our results demonstrate that the alternative host species *U. ambrosiae*, compared to the natural host species *M. euphorbiae*, affects the female's size, but did not affect parasitoid development time, longevity, emergence or sex ratio. The parasitoid *P. volucre* seems to be a good candidate for using as a biological control agent of *U. ambrosiae* on lettuce in Brazil.

· Ecotoxicological studies on the effects of conventional, biorational and botanical pesticides on natural enemies of crop pests: an ecological view

Since 2005, the Ecotoxicology laboratory at the CEPAVE and the CIMA (Centre for Ocean and Atmosphere Research) have been undertaking joint studies on pesticides associated to roundup ready soya, and their effects on the relevant natural enemies (NEs) of the main pests of this crop: *Trichopoda giacomellii* and *Trissolcus basalis*, parasitoids of nymphs, adults and eggs of the stink bug, *Nezara viridula*; the spider *Alpaida veniliae*, and *Chrysoperla externa*, both generalist predators. Evaluations were carried out with a novel ecotoxicological approach, related to the relevant ecological

aspects associated to the performance of the NEs. Five compounds have been analyzed to date, including lethal and sublethal concentrations, and different contamination routes. Cipermethrine proved to be the most toxic compound for the 4 NEs at every stage evaluated, even at concentrations in the order of 0.0005 mg/l i.a. The toxicity rank obtained was: cipermethrine>endosulfan>glyphosate>spinosad. Methoxifenozide resulted harmless for 3 of the 4 NEs evaluated, although reducing the fecundity of *A. venilae*. The data confirm a higher susceptibility among the parasitoids, obtaining the following ranking: *T. basalis>T. giacomellii>Alpaida veniliae> Chrysoperla externa*. The results alert us of the ecological impact of conventional pesticides, making it their replacement by biorational and NE compatible compounds imperative. New studies are in progress on NEs associated to the *Bemisia tabaci* complex. In the course of these studies new human resources are being formed for Argentina, enabling the development of this research line in the country.

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CEPAVE (Centro de Estudios Parasitológicos y de Vectores) Univ. Nac. La Plata – CONICET. www.cepave.edu.ar

· Potential for controlling codling moth in Argentina using the sterile insect technique and egg parasitoids

E. Botto & P. Glaz

Codling moth is the main pest affecting apples and pears worldwide. Most pest control strategies used against this insect have relied on the use of broad-spectrum insecticides which have led to non desirable effects like pesticide resistance, residues in the environment, human health concerns and the reduction of access to international markets. Therefore alternative pest control strategies addressed to a sustainable fruit production system and environmental care are strongly promoted. The use of ionizing radiation alone or combined with techniques such as biological control has been proved to be a valuable pest control tool in IPM strategies. The purposes of this research were to evaluate the response of an Argentinean codling moth strain to a sub-sterilizing radiation dose of 100Gy and to assess the acceptability and suitability of sterile codling moth eggs by the egg parasitoids, *Trichogramma cacoeciae* (Marchal) and *Trichogramma nerudai* (Pintureau and Gerding). Irradiated moth females survived better than irradiated males and non-irradiated males and females. Also, the fecundity of irradiated females was reduced by more than 30% as compared to non-irradiated ones whereas their fertility was barely null. The F_1 generation was male biased with a lower fertility (inherited sterility) than the parental generation. *T. cacoeciae* and *T. nerudai* parasitized both fertile eggs and sterile eggs.. However there was a significant reduction in acceptability for sterile eggs. *Trichogramma nerudai* parasitized more eggs than *T. cacoeciae* but egg acceptability for this species was proportionally lower than for *T. cacoeciae* mainly on eggs laid by irradiated females. Development to adult of both parasitoids species was not substantially affected by the origin of the eggs and the wasps had acceptable levels of adult emergence, survival and fecundity. These results provided useful information on the potential for controlling the codling moth using egg parasitoids and the sterile insect technique in Argentina.

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Full text next in Journal Applied Entomolology 2009)

· USE OF THE EGG PARASITOID TRICHOGRAMMA IN ARGENTINA.

Eduardo N. Botto, María. B. Riquelme and Cecilia. M. Horny.

The study and practical use of egg parasitoids (*Trichogramma* spp. and *Trichogrammatoidea bactrae*) in Argentina in the last nineteen years (1989-2008) has been mainly conducted at INTA Castelar. The goal of the research carried out has focused on *inventory and selection* of species, *mass rearing*; *storage and quality control*, *inundative release strategies* and more recently *on the side effects of pesticides*. Up to 2002 the following species have been recorded from field surveys: *Trichogramma pretiosum* (biparental strain), the most frequently found species in Argentina, *T. pretiosum* (uniparental strain), *T. rojasi*, and *T. columbiensis.* In the last years the combined use of classical (morphology) and molecular techniques allowed the addition of new species *T. bruni*, and *Trichogramma* spp. related to lepidopterous of the pampean area (unpublished data).
The species *Trichogramma nerudai* and *Trichogrammatoidea bactrae* were introduced to control different lepidopterous pests: *Rhyacionia buoliana* (pines) - *Carpocapsa pomonella* (apples) and *Tuta absoluta* (tomato), respectively. Despite both introduced species were field released only *T. nerudai* was recovered from codling moth (Alto Valle, Río Negro) and tomato moth eggs (Bella Vista, Corrientes). At present, *T. nerudai*, *T. pretiosum* (thelitokous strain) are being mass reared on *S. cerealella*. Storage techniques (cold and diapause induction) were successfully implemented on *T. nerudai* without affecting adult quality. Diapause induction on *T. bactrae* failed but it is possible to stored this species for about one month at low temperatures.
Different *Trichogramma* species have been field evaluated throughout inundative pest control strategies: *T. pretiosum* was effective in reducing early infestations of *A. argillacea* on cotton in Saenz Peña, Chaco; *T. nerudai* was assayed against *R. buoliana* on pines (Rio Negro and Chubut) with promissory results; preliminary studies on the effect of inundative releases against the codling moth *C. pomonella* on apples in Alto Valle, Río Negro, produced acceptable egg parasitism during the first generation; inundative releases of *Trichogrammatoidea bactrae* against *T. absoluta* caused a significant reduction (high parasitism rates on eggs of the tomato moth) in greenhouse grown tomatoes.
Pesticides side effects studies based upon IOBC standard methods were assessed on *T. bactrae* related to tomato crops and *T. nerudai* (tomato and apple crops). The technology developed to control both the tomato moth (*T. absoluta*) with inundative releases of *T. bactrae* in green houses and codling moth on commercial apple crops is being evaluated within IPM programs with positive results up to now. Advances in the transference to growers of the technology developed up to now is being evaluated.

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· Dose and number of releases of *Eretmocerus mundus* (Hymenoptera: Aphelinidae) to control *Bemisia tabaci* (Hemiptera: Aleyrodidae) in peppers

Bemisia tabaci is key pest of peppers, and its control is based exclusively on insecticides. The use of natural enemies is a strategy to be used integrated with other management strategies. *Eretmocerus mundus* appears as a promising biocontrol agent. Two experiments were performed to determine the number of releases needed to control the pest. **Release doses**: 12 muslin cages containing 6 peppers were placed inside an experimental macrotunel. Each cage was infested with whiteflies, and assigned to the following treatments: release of 0, 1 and 3 *E. mundus* couples/plant/week, with 3 releases in total. **Number of releases:** 24 cages were assigned to the following treatments, 0, 1, 2 and 3 introductions of *E. mundus* at the optimal dose resulting from the previous experiment. The number of normal and parasitized nymphs and adults were recorded for both experiments. Results show that the lowest dose was enough to keep the pest populations significantly below the levels in the controls (max levels 7.75 adults and 58.75 nymphs/cage; and 643.75 adults and 1598 nymphs/cage respectively) ($p<0.05$), with 85% parasitism. The parasitoid had to be released 3 times to obtain a good pest control (max levels 1.17 adults and 20.33 nymphs/cage vs. 55.67 adults and 75 nymphs/cage in the controls) with 84% parasitism ($p<0.05$). These results will be validated next in an exprimental pepper plot.

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· Habitat modification and inoculative releases of *Aphidius colemani* (Hym.: Braconidae) for control of *Myzus persicae* (Hemip.: Aphididae) in protected horticultural crops

Andorno A. V., López S. N. y Botto E. N.

Two biocontrol strategies for *M. persicae* were evaluated: habitat manipulation using oats as an alternative host, *Rhopalosiphum padi* as an alternative aphid, the parasitoid *A. colemani* (biocontrol agent), and biocontrol with inoculative releases of teh parasitoid in rugula. The experiments were conducted in a macrotunel at the INTA in Castelar, Buenos Aires. Twenty-four muslin cages (55x60x80cm) were used to which the following treatments were assigned at random: T1= rugula + *M. persicae*, T2= rugula + *M. persicae* + oats + *R. padi*, T3= rugula + *M. persicae* + inoculative releases of *A. colemani*, and T4= rugula + *M. persicae* + oats + *R. padi* parasitized by *A. colemani*. In T3, *A. colemani* was released 6 times at the rate of 2 couples/cage/week. In T4, flower pots with oats infested with *A. colemani* parasitized *R. padi* was introduced twice (1 pot/cage/fortnight); the first pot was introduced at the time of the initial infestation of rugula with *M. persicae*. The number of nymphs, adults and mummies on 10 leaves/cage was recorded every other day. The maximum nymph and adult populations of *M. persicae* in T4 (79.83 nymphs and 31.83 adults/10 leaves) did not differ significantly from T3 (480.5 nymphs and 109 adults/10 leaves), but was inferior to both controls (T1=835.33 nymphs and 126 adults/10 leaves, and T2=837.17 nymphs and 116.33 adults/10 leaves) ($p<0.05$). Maximum parasitism was 48% in T4 and 21% in T3. The host-aphid system appears like a promising biocontrol alternative for *M. persicae.*

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· Biocontrol of *Cydia pomonella*: evaluating the establishment of two exotic parasitoids, *Mastrus ridibundus* (Hymenoptera: Ichneumonidae) and *Ascogaster quadridentata* (Hymenoptera: Braconidae) in the upper Río Negro valley, Argentina

Hernández C. M.; Garrido S.; Botto E. N.; Chichón L. and Fernández D.

Mastrus ridibundus and *Ascogaster quadridentata* have been used successfully in several countries for classical bicontrol of *Cydia pomonella*. Both parasitoids were introduced in Argentina in 2005. The objective of this work was to evaluate the establishment of *M. ridibundus* and *A. quadridentata* in the upper Río Negro valley, Argentina between 2005 and 2008. Inoculative releases of adult parasitoids were done in 2-3 sites per season. The colonization process was monitored using corrugated cardboard strips fixed to tree trunks. During the 2005-06 growing season *M. ridibundus* adults were recovered from the 3 sites, observing parasitism proportions of 1-12%. *A. quadridentata* were not recovered. During the 2006-07 season *A. quadridentata* adults were recovered during February in both release sites, with parasitism of 1-9 %. During the months following winter, *M. ridibundus* adults were recovered from a single site only. During 2007-08 *A. quadridentata* was only released in two sites (1 new). Adults were recovered, and parasitism proportions of 10-31% were observed. Adults of *M. ridibundus* were also recovered with 3-4% parasitism rates in the sites were it had been released in past seasons. These results suggest that both natural enemies were capable of surviving and thrive in the field, indicating possible temporary establishment. In addition, *M. ridibundus* demonstrated to be able to overwinter in the area.

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· Quality control implementation in experimental rearing of *Diachasmimorpha longicaudata* (Hymenoptera: Braconidae) on *Ceratitis capitata* (Diptera: Tephritidae)

Peralta, P.A, M. Hoiak, C. Conte, A. Oviedo, L.Z. Carabajal Paladino, M.M. Viscarret and J.L. Cladera.

Parasitoid quality in a pest biocontrol strategy is a fundamental factor fopr its success. Quality control implies evaluating the production process of the product, in this case the attributes of the adult parasitoids. Knowing these parameters allows us to perform the adjustments in the rearing process conducive to improving parasitoid quality. Generally specking, quality controls are not performed in experimental colonies, although this would enable to know the characteristics of the species, and establish reference values. As a part of the experimental rearing of the parasitoid *Diachasmimorpha longicaudata*, we incorporated a quality control routine, taking into account the larval weight of the host (*Ceratitis capitata*, Diptera: Tephritidae) at the time of exposure, and the survival rate and fecundity of teh parasitoids obtained, with and without food. Insects were reared at 25º C and 75 % RH. The results obtained match those proposed by Cancino *et al*. (2004) in the Quality Control manual for mass rearing this species. Our parameters were similar to the reference

values, except survival of unfed adults, which was lower than expected. This may be because the host used in México is *Anastrepha ludens* (Loew), significantly larger than *C. capitata.* These first experiments indicate that the parasitoids we obtained are of similar quality figures to the established standards.

More info: Mariana Vizcarret, Instituto de Genética EAF. INTA Castelar -Buenos Aires.

· LIST OF PROJECTS AT THE IILB, IMYZA, INTA Castelar, Argentina

PNFOR2212
Integrated pest and disease management (forestry)
Leader: Eduardo Botto
Participants: (por IMYZA ninguno en este momento)

PNFRU2184
Integrated pest and disease management in fruit trees
Leader: Liliana Cichon (EEA Alto Valle, Rio Negro)
Participants: E. Botto, C. Hernandez, M. Viscarret, D. Arias, A. Cherino.

PATNO21
Pome-fruit health
Leader: Dario Fernadez (EEA Alto Valle, Rio Negro).
Participante: E. Botto, C. Hernandez, M. Viscarret, D. Arias, A. Cherino.

AEPV2553
Integrated pest management for sustainable agriculture
Leader: R. Lopez (EEA Bordenave)
Participants: A. Andorno, E. Botto, C. Pereyra, J. Delgado.

AEPV2552
Development of biological resources for pest management
Leader: Laura Gasoni (IMYZA)
Participants: E. Botto, S. López, M. Viscarret, D. Arias, A. Cherino, J. Delgado, C. Pereyra.

AEPV2
Development of IPM tactics against agricultural pollution hazards
Leader: E. Botto
Participants: (coordinators PE: D. Ducasse, L. Gasoni, R. Lopez.

AEPV3 (AEPV3561)
Design and organization of INTA plant protection unit web
Leader: V. Conci (IFFIVE)
Participants: E. Botto

INTA-IAEA PROYECT
Use of CM SIT to Facilitate the Implementation of IPM in Argentina
Leader: E. Botto

Participants: G. Quintana, (IMYZA), L. Cichon (EEA Alto Valle), M. Ritacco (CNEA), M. Gerding (INIA, Chile).

SPECILIZED TECHNICAL SERVICE AGREEMENT INTA-HUERTAS VERDES SRL.
Use of the parasitoids *Encarsia formosa* and *Eretmocerus mundus* (Hymenoptera: Aphelinidae), natural enemies of *Trialeurodes vaporariorum* and *Bemisa tabaci* (Hemiptera: Aleyrodidae) respectively, and *Tricogramma nerudai* (Hymenoptera: Trichogrammatidae) natural enemy of *Tuta absoluta* (Lepidoptera: Gelechiidae).
Leader: E. Botto
Participants: S.N. Lopez, A. Andorno, C. Pereryra, J. Delgado

· Biocontrol of *Tuta absoluta* with *Pseudapanteles dignus* (Hymenoptera: Braconidae) and *Dineulophus phtorimaeae* (Hymenoptera: Eulophidae)

María Gabriela Luna and Norma Sánchez

The Pest Ecology Lab of the CEPAVE (CONICET-UNLP, Argentina) is developing research related to biocontrol of the tomato moth, *Tuta absoluta* (Lepidoptera: Gelechiidae), an important pest of this crop in several Latin American countries that recently invaded Spain. Research includes biology, ecology and behaviour of two parasitoids of this pest, *Pseudapanteles dignus* (Hymenoptera: Braconidae) and *Dineulophus phtorimaeae* (Hymenoptera: Eulophidae), that are common in the horticultural belt of La Plata, the main tomato producing area in Argentina. Research is funded by the Agencia Nacional de Promoción Científica y Tecnológica, CONICET, and Universidad Nacional de La Plata. We also count with the invaluable cooperation of local farmers. To date these studies have been presented in several congresses, publications and a PhD thesis in progress.

· Areawide agroecological management of the coffee borer with emphasis on biological control.
Luis L. Vázquez Moreno (lvazquez@inisav.cu), Instituto de Investigaciones de Sanidad Vegetal (INISAV); Programa Ramal de Control Biológico. Ministerio de la Agricultura.

This project concluded in 2007, and is right now being implemented throughout the country's coffee growing areas. An agroecological programme was designed using 36 techniques applied at different stages of the coffee crop (pre harvest, harvest, post harvest and benefits). Up to 91.6% adoption of the method has been adopted. Five ant species were found in the coffee groves: subfamily Myrmecinae, *Wasmania auropunctata* (Roger), *Solenopsis geminata* (Fabricius), *Tetramorium bicarinatum* (Nylander), *Monomorium floricola* (Jerdon) and *Pheidole megacephala* (Fabricius). Groves with higher incidences of *S. geminata* and *T bicarinatum*, had less coffee borer (*Hypothenemus hampei*). The pathogenic fungus *Beauveria bassiana* (Balsamo) Vuillemin was found causing epizootics in coffee borer of up to 40%. These were observed mostly from the middle toward the end of the harvest in the groves shaded with large to mixed size trees (*Theobroma cacao*, *Citrus* spp., *Mangifera indica* and others), and those with temporary shading with banana trees (*Musa* spp.). However, groves with lower shading had lower incidence of the pathogen. Studies of the micobiota associated to *H. hampei* lead to the isolation of 26 species belonging to four genera of filamentous

fungi and one unidentified yeast. Studies in groves treated with herbicide, free weed growth and mulching determined that the groves with mulch had the lowest incidence of the pest, followed by the herbicide treated groves. Trapping was also used; the highest captures (205.75 adults/wk) were obtained in methanol:ethanol 3:1 mix, over ethanol alone or ethanol + ground coffee. No significant differences were observed according to trap height (0.30; 0.60 and 1.20 metres), nor between traps in the middle of the groves compared to traps placed between groves. Traps placed by the grove, but adjacent to roads did show reduced captures. Adult females fell in the traps at increasing rates toward the end of the harvest (October, November, December), reaching its highest peak during the post harvest period (April). After that captures remain at low levels during pre harvest and early harvest periods.

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· PREDATION POTENTIAL OF FOUR PHYTOSEIID SPECIES ON *Brevipalpus phoenicis* (ACARI: PHYTOSEIIDAE, TENUIPALPIDAE) IN COFFEE PLANT

Paulo Rebelles Reis, Adenir Vieira Teodoro and Marçal Pedro Neto

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The mite *Brevipalpus phoenicis* (Geijskes, 1930) (Acari: Tenuipalpidae) has been reported on coffee in Brazil since 1951, and later associated to ring spots caused by Rhabdovirus (CHAGAS, 1988). *B. phoenicis* is often found associated to Phytoseiidae mites, like *Iphiseiodes zuluagai* Denmark & Muma, 1972, *Euseius alatus* DeLeon, 1966 and *Amblyseius herbicolus* (Chant, 1959), that together with *Amblyseius compositus* Denmark & Muma, 1973, have been studied as predators of *B. phoenicis*. The predatory potential of the mites was assayed in 3-cm arenas made with pesticide-free coffee leaves (C*offea arabica* L.), at 25 ± 2 °C, 70 ± 10% RH, and 14-hour photoperiod. The arenas were placed floating on water in Petri dishes. Four replicates -plus controls- for each mite species were performed with one larva, one nymph, one male and one female predator for 20-30 *B. phoenicis* (eggs, larvae, nymphs and adults). Results were recorded after 24 hours. Predation by larvae and males was generally lower than predation by females and nymphs, which was larvae (84, 95, 91 and 89%) > eggs (56, 96, 91 and 88%) > nymphs (50, 87, 80 and 82%) > adults (2, 24, 8,5 and 23%) for *E. alatus*, *I. zuluagai*, *A. compositus* and *A. herbicolus* respectively. Adult females were the most efficient predators.
(a more detailed version of this report can be found in the Spanish version of this newsletter)

9. MASTERS AND PH.D. DISSERTATIONS

· Microhymenopteran egg parasitoids of insects and spiders: a systematic and biological study of potential integrated pest control
Thesis by Cecilia Margaría
Directors: Drs. Marta Loiácono and Analía Lanteri (Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata).

The Scelionidae are a family of microhymenoptera of cosmopolitan distribution with around 250 genera and over 3300 species. They are idiobiont endoparasitoids of spider and insect eggs in the orders Orthoptera, Odonata, Mantodea, Embidiina (= Embioptera), Hemiptera, Neuroptera, Coleoptera, Diptera y Lepidoptera. In this study we worked on 47 species of Scelionidae in the genera most often used for biocontrol: *Scelio* (Scelionini), parasitoids of Orthoptera: Acrididae; *Baeus* (Baeini), parasitoids of spiders in the families Araneidae and Theridiidae; *Gryon* (Gryonini), parasitoids of herbivorous Hemiptera, mainly Pentatomidae, Coreidae and Scutelleridae; *Trissolcus*, *Phanuropsis* and *Telenomus* (Telenomini), parasitoids of herbivorous, haematophagous and predatory Hemiptera (Pentatomidae, Reduviidae, etc.), and Lepidoptera. We provide a key to species for each genus, and two keys in the case of *Telenomus*, one for parasitoids of eggs of Reduvidae that transmit Chagas-Massa disease, and another for parasitoids of pest Lepidoptera se hicieron dos claves, una para determinar las especies que parasitoidizan posturas de (Lymantriidae, Nymphalidae, Pyralidae, Saturniidae and Sphingidae). The "mapping or optimization of adaptive traits" technique was used to analyze the evolution of the host-parasitoid associations on a tribal cladogram, using the programme NONA. Results indicate that the Orthoptera are the ancestral hosts of Scelionidae. The second group of most important hosts are the Heteroptera. Colonization of this suborder appears to have happened at least twice. Results also suggest that phylogeny dos not determine colonization of new host taxa, but similarities in ecological habits, mainly through oviposition sites. From the applied stance, in biocontrol of agricultural and sanitary pests from Argentina and neighbouring countries, the following associations appear:

- Three species of *Gryon* (*G. scutellatum, G. variicornis* y *G. vitripenne*) parasitize Heteroptera in the genera *Antiteuchus*, *Edessa* and *Holhymenia*, pests of soya and other leguminous crops, rice, and pastures, among other crops.
- Several species of *Telenomus* (*T. alecto, T. dolichocerus, T. podisi* and *T. solitus*) and *Trissolcus* (*T. basalis, T. leviventris, T. teretis* and *T. urichi*) could be used in biocontrol of hemipterans in the genera *Dichelops, Loxa, Pellaea, Podisus, Tibraca* and *Holhymenia*, and Lepidoptera in the genera *Tolype* and *Caligo*, pests of soya, maize, rice, forage legumes, bananas, fruit trees and ornamentals.
- Three species of *Baeus* (*B. anelosimus, B. jabaquara* and *B. cyclosae*) could be of use for the control of araneids and teritids of the genera *Anelosimus* and *Cyclosa*.

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· Impact of education on the adoption of agroecological practices for pest management in urban agriculture in La Habana.

Masters thesis: Antonio S. Fernández Almirall.

Director: Luis L. Vázquez Moreno. Ph. D. Profesor e investigador Titular. Instituto de Investigaciones de Sanidad Vegetal (INISAV). Correo electrónico: lvazquez@inisav.cu

Urban agriculture in La Habana was studied to measure the impact of education in agroecological pest management practices during 2003-2007. The type of education was categorized by the four levels that define it: reaction of the student, learning, behaviour, and results. This was evaluated through with polls, workshops, and statistical information. The following education systems were used: seminars, conferences expositions, technical exhibitions, radio diffusion, workshops, and courses. A totoal of 37,000 educational activities were recorded during 2003, with the participation of 24,120 farmers, of which 93% considered the practices promoted efficient, while 7% had reservations. Farmers learned 22 techniques, and most show solid ideas referred to soil management, plant diversification, and biocontrol. Results showed a clear increase in the adoption of these practices, since half the techniques were adopted by 80% of the farmers, and at least techniques by 50 to 80%. We recommend the creation of a manual, and the implementation of impact evaluation before, during, and after the courses.

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10. LATEST BIOCONTROL PUBLICATIONS IN THE NTRS

This section presents some of the latest publications on biocontrol of the NTRS. It only includes references and summaries provided by our affiliates, and does not presume to be an exhaustive enumeration.

Books and book chapters:

M. V. Sampaio, V. H. P. Bueno, L. C. P. Silveira, A. M. Auad. 2008. BIOLOGICAL CONTROL OF INSECT PESTS IN THE TROPICS, in *International Commision on Tropical Biology and Natural Resources*, [Eds. Kleber Del Claro, Paulo S. Oliveira, Victor Rico-Gray, Ana Angelica Almeida Barbosa, Arturo Bonet, Fabio Rubio Scarano, Francisco Jose Morales Garzon, Gloria Carrion Villarnovo, Lisias Coelho, Marcus Vinicius Sampaio, Mauricio Quesada, Molly R.Morris, Nelson Ramirez, Oswaldo Marcal Junior, Regina Helena Ferraz Macedo, Robert J. Marquis, Rogerio Parentoni Martins, Silvio Carlos Rodrigues, Ulrich Luttge], in *Encyclopedia of Life Support Systems (EOLSS)*, Developed under the Auspices of the UNESCO, Eolss Publishers, Oxford ,UK, [http://www.eolss.net] [Retrieved November 3, 2008].

Summary
Biological control is a pest control method with low environmental impact and small contamination risk for humans, domestic animals and the environment. Several success cases of biological control can be found in the tropics around the world. The classical biological control has been applied with greater emphasis in Australia and Latin America, with many success cases of exotic natural enemies' introduction for the control of exotic pests. Augmentative biocontrol is used in extensive areas in Latin America, especially in the cultures of sugar cane, coffee, and soybeans. The conservation of natural enemies is the biocontrol method most often reported in Africa

and Asia, where most of the major pests are native, as well as their natural enemies. Although the use of biological control encompasses large areas in every continent with tropical climate, there is a much greater use potential than what has been employed. Many exotic pests are possible targets for the classical biological control. The augmentative biological control is used only in few cultures and for a limited number of pests, and deserves greater attention. Tropical diversity is very large, indicating a source for the conservation of natural enemies. Greater popular appeal and the implementation of policies are required for a greater expression of biocontrol of insect pests in the tropics. Biological control is environmentally sound, effective on the long term and sustainable; therefore, it is the best control option.

· List of hymenopteran parasitoids and predators of insects of Argentina. First supplement

Luis De Santis† and Norma Cristina Monetti†
Compiled and updated by Marta Loiácono, Cecilia Margaría, Norma Diaz and Fabiana Gallardo
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This study is a supplement of the previous list of hymenopterans parasitoids and predators of argentine insects (De Santis & Esquivel, 1966). We recorded 392 insect hosts and 1003 associations. Hemiptera have the highest number of the associations recorded.

Published in "Contribuciones Taxonómicas en Ordenes de Insectos Hiperdiversos, pp.91 -139, Llorente Bousquets J.& A.Lanteri, eds., Universidad Autónoma de México, (UNAM), Facultad de Ciencias, México, 221, pp. 2008.

Congresses and articles:

Schneider, M., Pineda,S. and Aliardi, D. 2006b. Estudios preliminares del impacto ecológico de plaguicidas convencionales y de nueva generación sobre larvas de Chrysoperla externa (Neuroptera: Chrysopidae). En: Libro de Resúmenes del XXI Reunión Argentina de Ecología, pp 62.

Schneider, M.I., Pineda, P. and Smagghe, G. 2006a. Side effects of conventional and non-conventional insecticides on eggs and larvae of *Chrysoperla. externa* (Hagen) (Neuroptera: Chrysopidae) in Argentine. Comm. Appl. Agricult. Biol. Sci., 71 2b: 425-427.

Rimoldi, F, Schneider, M., Martinez, A.M and Ronco, A.E. 2006. Estudios ecotoxicológicos de insecticidas utilizados para el control de plagas de la soja, sobre huevos del predador generalista *Chrysoperla externa* (Hagen, 1861) en laboratorio. En: Libro del X Congreso Internacional de Manejo Integrado de Plagas y Agroecología. México. (trabajo completo): 117-119.

Rimoldi, F., Schneider, M., and Ronco, A. 2008. Susceptibility of *Chrysoperla externa* eggs (Neuroptera: Chrysopidae) to conventional and biorational insecticides. Environ. Entomol. 37(5): 1252-1257.

Benamú, M., Schneider, M, Sánchez, N. and González, A. 2006. Efectos ecotoxicológicos de concentraciones subletales de spinosad sobre el comportamiento de *Araneus pratensis* Emerton (Aranee: Araneidae). En Libro

de Resúmenes de las 1ras Jornadas Uruguayas de Comportamiento Animal. Montevideo-Uruguay, pp 22.

Benamù, M.A., Schneider, M.I., Sanchez, N.E. and Gonzalez, A. 2008. Effects of pesticides on the development of oocytes and *Alpaida veniliae* (Araneae: Araneidae). En: Libro de Resùmenes del XI Congreso Argentino de Ciencias Morfológicas (Publicación en CD).

Benamú, MA., Schneider, M.I., Pineda, S., Sanchez, N.E. and Gonzalez, A. 2007. Sublethal effects of two neurotoxicans insecticides on Araneus pratensis (Araneae: Araneidae). Comm. Appl. Agr. Biol. Sciences 72/3: 557-559.

Schneider, M.I., Sanchez, N.E., Pineda, S., Chi, H. and Ronco, A. 2009. Impact of glyphosate on development rate and demography of *Chrysoperla externa* (Neuroptera: Chrysopidae). Chemosphere (*enviado*).

Luna, M., P. Pereyra, N. Sánchez, E. Nieves, M. Guzmán, V. Wada y D. Oliveira. 2004. Análisis del complejo de parasitoides larvales de la polilla del tomate, *Tuta absoluta*, a diferentes escalas en el cultivo de tomate. II Reunión Binacional de Ecología. Mendoza.

Pereyra, P., N. Sánchez; E. Nieves y D. Oliveira. 2005. Patrones y preferencias de oviposición de *Pseudapanteles dignus* (Hymenoptera, Braconidae) sobre *Tuta absoluta* (Lepidoptera, Gelechiidae). VI Congreso Argentino de Entomología. Tucumán.

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11. IOBC INTERNET BOOK ON BIOCONTROL

The FOURTH EDITION of the IOBC INTERNET BOOK OF BIOCONTROL IS OUT: see IOBC-Global.org

IOBC Internet Book of Biological Control

Aim: to present the history, the current state of affairs and the future of biological control in order to show that this control method is sound, safe and sustainable

The fourth edition of the book (October 2006) of more than 100 pages with information about biocontrol is available for free on our website.

We ask you to support the preparation of this book. The first priority is to receive summaries of the actual application of biological control in each country or region. The second priority is to document the history of biological control in each country, including some key references, so that it will be easier for all biocontrol workers worldwide to know what has been done and what is going on at this moment.

This will help us to make clear how important biological control is. We have received several very good contributions during the past months, which will be included in the fourth edition,
THANK YOU.

12. IOBC GLOBAL JOURNAL BIOCONTROL

BioControl is the official journal of the International Organization for Biological Control (IOBC). It includes original papers on basic and applied research in all aspects of biological control of invertebrate, vertebrate and weed pests, and plant diseases. Subject areas covered in **BioControl** comprise biology and ecology of organisms for biological control, and various facets of their use including any biological means of control for integrated pest management (IPM) such as plant resistance, pheromones and intercropping. Developments in molecular biology and biotechnology that have direct relevance to biological control will also be considered for publication. BioControl also publishes forum papers and reviews (solicited by the Editor-in-Chief), Letters to the Editor on critical issues, and research notes relevant to biological control.

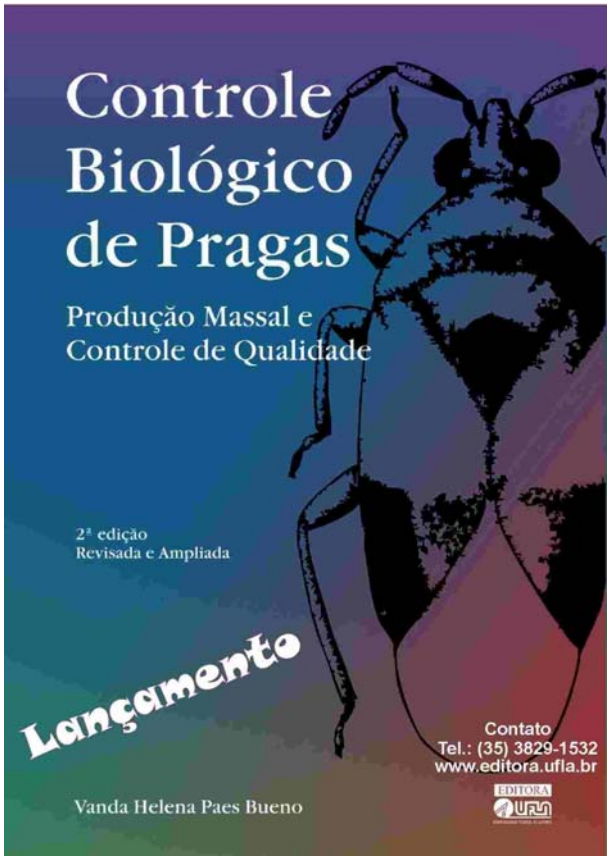
BioControl does not have page charges (except for colour pages).

Impact factor: 1.324 (2005)
Section "Entomology": Rank 16 of 66

Abstracted/Indexed in:
Biological Abstracts, BIOSIS, CAB Abstracts, CABS, Chemical Abstracts Service, Current Contents/ Agriculture, Biology & Environmental Sciences, Entomology Abstracts, Geobase, Pest Management Focus, SCOPUS
http://www.springerlink.com/content/102853

13. PUBLICATIONS AND BOOKS ON BIOCONTROL

Si faltaran comentarios sobre libros recientes de control biológico o IPM, envíenos (colazza@unipa.it; o gcabrera@speedy.com.ar) una foto .jpeg de la carátula, un sumario breve de su contenido, y datos sobre cómo y donde conseguirlo. Envíenos asimismo archivos .pdf o separatas de nuevas publicaciones en control biológico y serán incluidas en nuestro próximo boletín.



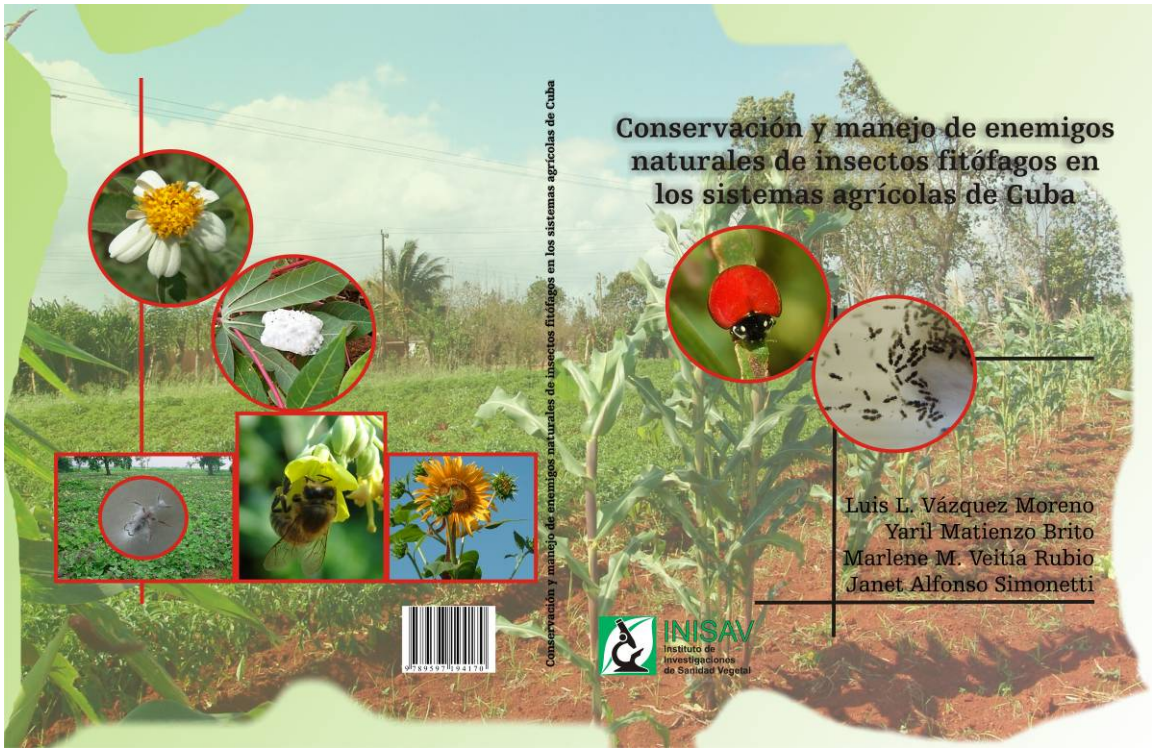
New IPM book

Edited by: Editorial Nuevo Milenio y CIDISAV. Ciudad de La Habana, Cuba. 2008. ISBN: 978-959-05-0543-0

Author: Luis Ladislao Vázquez Moreno. Instituto de Investigaciones de Sanidad Vegetal (INISAV). Ciudad de La Habana, Cuba. Correo electrónico: lvazquez@inisav.cu

Contents: this book is organized in the form of questions and answers. It has 486 pages, including figures and tables. It is written for farmers and agronomists working directly in the field. Chapter 1. Agriculture, plant protection, and pest control; Chapter 2. Research for pest management; Chapter 3. Agroecological basis of pest management; Chapter 4. Follow-up and decision rules for pest management; Chapter 5. Agroecological management in the farm; Chapter 6. Bioregulators and biological control; Chapter 7. Uses and risks of synthetic pesticides; Chapter 8. Recomendations for control of the main pest types; Chapter 9. Cuban experience in the transition toward sustainable agriculture.

Conservación y manejo de enemigos naturales de insectos fitófagos en los sistemas agrícolas de Cuba
Luis L. Vázquez, Yaril Matienzo, Marlene Veitía, Janet Alfonso. Correo electrónico: lvazquez@inisav.cu
CIDISAV, Ciudad de La Habana. Cuba. 2008. ISBN 978-959-7194-17-0



14. PUBLICITY AND ADS

SANOPLANT
We invite you to visit our WEBPAGE to see our catalogue of biological supplies. HTPP/ www.sanoplant.com.co

Companies commercializing natural enemies in Brazil:

- **Biocontrole Métodos de Controle de Pragas** (http://www.biocontrole.com.br/) has a number of bioproducts available to be used in IPM programs, mainly insect pheromones. They sell a number of pheromone traps that are commonly used in Europe and USA. They have products available to many crops, such as tomato, cotton, citrus, tobacco, and corn among others.

- **BUG Agentes Biológicos** (http://www.bugbrasil.com.br/) is a company located in Piracicaba/SP which produces and sells *Trichogramma* species for the biological control of tomato, corn and sugarcane pests. This company also has other bioproducts available and a line of traps suitable to a variety of agroecosystems. They complement their line of products making available literature in the field of biological control.

- **Itaforte Bioprodutos** (http://www.itafortebioprodutos.com.br/) is a company located in Itapetininga/SP which produces and sells a number of entomopathogenic fungi, such as *Beauveria*, *Metharizium*, *Lecanicillium* and *Trichoderma*.

15. ACKNOWLEDGEMENTS

Newsletter contributions: We would like to thank all members who provided items for this edition of the IOBC Newsletter. If you have not previously sent anything, please consider doing so. Remember that this is your opportunity to let others know what is going on in biological control. Take a few minutes and email items concerning biological control to Willie Cabrera Walsh (gcabrera@speedy.com.ar), so they can be included in the next issue.

Any comments on this newsletter are welcome. Do not hesitate to contact us if there is any further information on biological control that you would like to see here.

Editor: Willie Cabrera Walsh, February 2009