**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)**
**Seção Regional Neotropical (SRNT)**
**Neotropical Regional Section (NTRS)**

# Newsletter of the IOBC - NTRS No. 15

**December 2006**

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## 1. EDITORIAL: THE ISSUE OF ORGANISM TRANSPORT AND SANITARY AGENCIES IN BIOCONTROL

Biological control relies in great measure on the controlled, deliberate and systematic movement of beneficial organisms across national and biogeographic boundaries. The matter of this exchange is mostly insects, other invertebrates, and micro organisms, and it is often the purposeful result of the previous release, accidental or not, of their natural hosts in a new environment.

Although augmentative and inundative releases of native organisms, or management practices that enhance natural enemies, are an important aspect of biocontrol, the release of exotic organisms, especially for the control of exotic pests, both insects and weeds, is still one of its chief activities, and possibly the one with the highest record of successes.

However, collecting organisms in a country other than your own, and transporting them across state boundaries is not easy anywhere in the world. Nor should it be. But incongruently, it is easier in countries with good sanitary records than in the countries -usually underdeveloped-, where controls of almost any type are less, or at any rate weaker. A central difference between the more flexible and the inflexible "types" of sanitary authorities, is that in most developed countries scientists are considered responsible, well meaning experts, and for the most part the highest knowledgeable authority regarding the safety of an introduction. In these countries, scientists are expected to explain clearly why they are introducing an organism, what they plan to do with it, and what safety measures will be taken. This proposal is evaluated by an expert board, and more often than not, said organism will be allowed entrance. If the organism is to be released into the environment, the safety demands are, naturally, much more stringent, but, on the other hand, few scientists would even think of applying for release unless they can make a convincing safety-need-benefit case. In addition, the whole process occurs within a reasonable time frame.

In our countries, however, everyone is considered to be equally irresponsible and untrustworthy, and every introduction is considered *a priori* undesirable. The laws are often virtually unworkable, or are not instrumental to beneficial introductions, sometimes to the point where the authorities that have to exert the controls, authorizations, design the rules, etc., do not have a clear idea of how to go about it. Consequently, they act on a "forbid all" basis. Furthermore, their attitude is often far from cooperative.

A completely different issue, and one that deserves a more critical retrospective from developed countries, is the question of the historical exploitation of the natural resources from developing countries, by the developed, or so called "first world" countries. This has been going on for centuries, and is a constituent aspect of every political, military, and economical dominance process in mankind's history. In fact, it is as old as history, as injustice, as greed. However, even in recent times, when both the scientific and public notion of the value and frailty of natural resources have increased significantly and is on every state's agenda, we find examples of unfair natural resource commerce. One of the most obvious, but by no means sole examples, is that of the medicinal products obtained from developing countries, very often part of their ancestral lore, that are developed into industrialized medicines for which they must subsequently pay royalties to go on using. Another common example is when a resource becomes scarce simply due to more sophisticated extraction methods employed by foreign corporations.

However, the untrusting attitude toward organism exchange in many developing countries is not focused only toward scientifically developed countries with a dubious record of unrecognized exploitation of other country's genetic patrimony (to call it something). It is laid indiscriminately on everyone, and among each other as well. In this conspiracy perceived world, everyone is *a priori* guilty of misdemeanour, and trying to work your way into the "legal" group can be impossible, or depend on luck and unlimited time, when not bribes.

Yet another different matter, and I will be stretching my opinion and innocence way out here, are the unique traits of the discipline of biological control. In spite of the heavy ammunition biocontrol has suffered in the last few years, I have the perception that this science has always had one of the tidiest, if not the highest, work ethics and environmental conscience records of all. And I know I am not alone here. Many scientists, who have earned their right to argument this in the highest academical forums, believe so too. I sincerely consider that biocontrol, should not be grieved by the same "criminal oriented" legislation as chemical companies, plant breeders, pet dealers, timber suppliers, fresh product merchants, etc.

I firmly believe that biocontrol is an unique discipline within the applied sciences: environmental consciousness is not an issue to deal with, it is one of its constituent traits; the organisms we deal with are seldom fodder for greedy patents and exclusive exploitation rights; exchange is *always* desirable and positive; the knowledge acquisition associated to biocontrol studies are never state or corporation secrets, since it is always circulated freely and with pride.

Some controls should persist to prevent the benefits derived from a cooperative biocontrol project from being too one-sided. However, I personally cannot think of many cases where this has happened -in recent times, that is-. The benefits for the recipient side of a biocontrol project, the country that has the chance to reduce the impact of a pest insect or weed, is obvious. In fact, it can be calculated in cash most of the time. But the benefits for the donor country, the country that provides the biocontrol agent, are more difficult to account for. However, and although it is a discussion that goes beyond this brief essay, they are many and vital to science in our countries. Thousands of scientists and institutions rely heavily on foreign funds to operate -I should know, I am one of them-; thousands of projects in Latin America and other developing countries exist from their inception in great part thanks to foreign funding, many of them would not even exist, or would die at birth, otherwise; in retrospective, the mass of knowledge we Latin American scientists have acquired thanks to foreign funding for biological control explorations and assessments is colossal, and in any field imaginable: biota inventories, knowledge of the ecological and energetic processes taking place in our vast territories, basic exploration, ecological impact of any number of anthropic processes, you name it. Unaccountable but invaluable. Last but not least, the information procured for foreign science, can *always* be applied at home in one way or another.

Lest I left something liable to misinterpretation, I would like to make clear that I do not expect for biocontrol workers to be considered above the law. In fact, quite on the contrary, I expect biocontrol workers to be controlled by the fittest possible corps: ourselves. Every biocontrol worker is willing to help a colleague, but he/she is also intent on controlling and foiling hazardous releases of organisms, for whatever purpose, possibly with better knowledge and more zeal than any border authority. Even so, these tend to ignore our opinion, or not recur to it as often as expected. I insist, however that all biocontrol workers wish to help their colleagues, I dare say regardless of her or his nationality. Furthermore, all biocontrol workers *do* help their colleagues. Anyone who has been treading the far and wide fields anywhere in the world for a number of years, knows that next to nothing can be accomplished without the help of local colleagues: someone who can put in a word for you, or lend you laboratory space, or even do some of the work for you, sometimes out of pure goodwill.

The conclusion, and maybe final proposal of this rant, is the following: we could open a registry of biological control workers from the Americas, a list of the people with proven capacity and long standing work in the diverse field of biological control. This list should be public and easily available; it should function both as a directory and a curricular database. More importantly so, it should be made available, and brought to permanent attention, to foreign and local sanitary authorities alike. With present day technologies and the World Wide Web, fraudulent inscriptions would be almost impossible. Furthermore, the world of biocontrol in Latin America is not really so big, we all more or less know each other.

In the course of time, this list could work as a self-sustained and self-controlled sanitary organism, or, at any rate, an important advisory board for such organisms. We could help our border authorities and environmental bureaus make the transition from the "prohibiting offices" they are today, to the controlling but facilitating institutions they are in other countries, where national interest and cooperating science do not seem irreconcilable.

There is an interesting example of such a process in the works going on right now between our laboratory, the SABCL (see article below), and Argentina's main sanitary and fauna protection authorities, the **SENASA** (**Servicio de Sanidad Animal y Calidad Agroalimentraria**) and its plant protection office (**Dirección Nacional de Protección Vegetal**), and the **Dirección de Fauna Silvestre**. In the past, in Argentina and neighbouring countries, controls for the exchange of beneficial organisms had become so stringent that this exchange became nigh impossible. However, an open-minded but scientifically sound new attitude has appeared in said organisms, to such a degree that they are steadily developing, with the scientific community's help, mechanisms to allow this scientific exchange of beneficial organisms.

I am confident that in due course, this organ of biocontrol experts from Latin America could help our countries to transmute from the purely agent donors they are at present, to countries where the full potential of biological control could be applied.

W. Cabrera Walsh
General Secretary, IOBC/SRNT

## 2. MEMBERSHIP FEES

In the past, countries with their economies directly or indirectly tied to the dollar –i.e. Argentina, Chile and Uruguay- paid, justly enough, a higher members fee than the other countries. However, when these countries devaluated their currencies, this difference ceased to make sense. The IOBC fees for the NTRS have been modified after discussing the matter during the IOBC meeting in Recife, last August. It was finally agreed that every paying country would pay the same fee. Countries that are excused from the IOBC fee will continue to be so.

The fees for the IOBC-SRNT for the period 2006-2007 has been agreed in 15 Euros = 20 U$S (roughly 60 $ Argentinos; 50 Reais; 10500 $ Chilenos, 46000 $ Colombianos; 470 $ Uruguayos, etc.)

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 websiteo: 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.

## 3. IOBC-GLOBAL WRITING PARTNERSHIP

Among the benefits of your IOBC membership, we mentioned the “Global Writing Partnership”. This unique service was designed to help non-English speakers to get their work published in widespread journals, all of which, whether we like or not, currently publish in English. I presume it is unnecessary to mention the benefits of publishing in English, and in international journals, but apart from the obvious personal benefits there are countless institutional and regional benefits, because the scientific production of Latin American scientists is often ignored, not because of its quality, but simply because it fails to be broadcasted properly.

Since the start of the IOBC writing partnership programme, IOBC assisted in preparing more than 40 manuscripts from members in Latin America, Central Europe and Asia for several refereed biological control and entomological journals.

There were quite a number of applications for this service from non-IOBC members, but we had to inform the applicants that we can only do this very time consuming work for our members.

You can apply for a writing partnership if you are from a non-English speaking developing country and member of IOBC. See our website, IOBC-Global.org, for more details and an application form.

## 4. STATE OF AFFAIRS OF THE IOBC/NTRS

La IOBC- Neotropical Regional Section (NTRS), has grown a lot the last few months. However, some countries with an important background in biocontrol (notoriously Argentina, Chile, and Colombia, to mention a few) are underrepresented. We believe we must promote and stimulate Biological control in Latin America, give it public visibility and notoriety, coordinate projects at a regional level, and work together to give our discipline the development it deserves in our continent.

## 5. COURSES

**INTEGRATED PEST MANAGEMENT COURSE: arthropods, diseases and weeds (EMIP)**

March 2007, Instituto de Microbiología y Zoología Agrícola (IMYZA INTA Castelar) and Facultad de Agronomía y Ciencias Alimentarias (Universidad de Morón), Buenos Aires, Agentina

This EMIP is oriented to agricultural scientists and similar professionals, and is organized in three blocks: Basic (1st trimester: 176 h), Specific (2nd quarter: 168 h), Integration (3rd quarter: 204 h)

Information: Dr. Roberto Lecuona
rlecuona@cnia.inta.gov.ar
IMYZA-INTA Castelar
www.inta.gov.ar/imyza

**AGROECOLOGICAL MANAGEMENT OF PESTS IN PRODUCTION SYSTEMS**

**INISAV, La Habana, Cuba, del** 18 - 22 de June, 2007

General programme:

- Management of the production system
- Monitoring and tagging pests
- Biocide residues management
- Soil pest management
- Plant diversity management
- Biopesticide production at local scale
- Local production of entomphages
- Natural enema conservation
- Biocontrol use by farmers
- Case studies
- Preparation and use of organic fertilizers

For more details contact:
**Luis L. Vázquez Moreno. Ing. Agron., Ph. D.**
Email: lvazquez@inisav.cu
Fax: (537) 2029366, 2040535
Address: Calle 110 # 514 e/ 5taB. y 5ta F.
Playa. CP 11600. Ciudad de La Habana.
Cuba.
http: // www.inisav.cu

**PRODUCTION OF ENTOMPATHOGENIC ORGANISMS FOR BIOCONTROL OF AGRICULTURAL PESTS**

INISAV, Ciudad de La Habana, Cuba, 6 - 10 November 2007
Professor: Dr. Orietta Fernández-Larrea Vega
40 hours (5 days)

Programme:
- Principal microorganisms entomopathogens and antagonists in biocontrol.
Basis for mass production.
- Isolation, identification and characterization of *Bacillus thuringiensis*.
Preservation methods.
- Media preparation and production processes.

- Isolation, identification and characterization of entomophagenic fungi. Preservation methods.
- Media preparation and production processes for fungi.
- Visits to biopesticide production centres.
- Quality control of processes and products.
- Formulation of biopesticides.

Information: MSc Bertha Carreras Solís
bcarreras@inisav.cu or FAX 53 (7) 209-1111; Phone: 53(7) 203-5011

## 6. WORKSHOPS AND MEETINGS

**XIIth INTERNATIONAL SYMPOSIUM ON BIOLOGICAL CONTROL OF WEEDS**
La Grande Motte, Montpellier, France, 22 – 27 April 2007
The International Symposium on Biological Control of Weeds traditionally focuses on classical biological control: the use of exotic biological control agents to manage alien invasive plants. However, while the current conference can not embrace biological control or biocontrol of weeds in the broadest sense, in the interests of encouraging original and novel presentations, we have broadened the scope to include all types of biological control of all weeds through the use of living organisms as biological control agents, including augmentative biocontrol (arthropods, mycoherbicides) and conservation of natural enemies. The main topics will be:

- Regulations & public awareness
- Target and agent selection
- Pre-release specificity & efficacy testing
- Release activities
- Management specifics
- Novel Approaches
- Opportunities and Constraints for BC in Europe

Information: weeds2007@ars-ebcl.org, rsforza@ars-ebcl.org

PRODUCTION AND MANAGEMENT OF BENEFICIAL ARTHROPODS
Hotel Panorama, Miramar, Ciudad Habana, 15 - 18 May, 2007
**Fees:**

? Nacional delegates: 150 MN
? Foreign Delegates:150 CUC$
? Students:100 CUC$

More info.: entomofagos2007@inisav.cu,
Or: Dr. Elina Masso Villalón: emasso@inisav.cu
Dr. Mayra Ramos: mayramos@inisav.cu
MSc. Eleazar Botta Ferret: ebotta@inisav.cu

**SICONBIOL**
This is the 10th edition of this congress, and it will take place in Brasilia, from June 30 to July 4, 2007. Visit our website (http://siconbiol.cenargen.embrapa.br).

During this edition of SICONBIOL, we will hold the IOBC/NTRS symposium:
**Biological Control, from production to sales**.
1. Challenges in mass production

2. Natural enemy quality
3. Entomophages in the era of transgenics
4. Obstacles and successes in natural enemy marketing

Information and suggestions at:
xsicombiol@cenargen.embrapa.br <mailto:xsicombiol@cenargen.embrapa.br>.

Rose Monnerat – President of the Organizing Committee

**APHIDOPHAGA MEETING IN ATHENS**
Please, visit the web page www.aphidophaga10.gr with new information regarding the Ecology of Aphidophaga 10 Symposium to be held in Athens, in September 2007.

**IOBC/SRNT and SRN Meeting**
Biocontrol without frontiers - Monterrey , México - November 5-9, 2007.

## 7. THE ARS/SABCL LABORATORY IN HURLINGHAM, ARGENTINA

The ARS South American Biological Control Laboratory of the US Department of Agriculture is a small but active laboratory located in Hurlingham, Buenos Aires province, Argentina. The first biocontrol partnership between the ARS and a South American institution was located in 1958 in Montevideo, Uruguay, where it was established to find natural enemies of North American pests of Neotropical origin. In 1962 the South American Biological Control of Weeds Laboratory was set up in a building in the INTA agricultural station in Castelar, Buenos Aires province. It moved to its current location in 1968. Its first projects dealt with the aquatic weeds alligator weed (*Alternanthera philoxeroides*), and water hyacinth (*Eichhornia crassipes*). In the 70s it fanned out to rangeland weeds and filth flies.

At present, the SABCL, the acronym by which it goes now, has both weed and insect biocontrol projects: Brazilian peppertree (*Schinus terebinthifolius*), alligatorweed, fanwort (*Cabomba caroliniana*), balloon vine (*Cardiospermum grandiflorum*), pompom weed (*Campuloclinium macrocephalum*), Barbados gooseberry (*Pereskia aculeata*), Brazilian waterweed (*Egeria densa*), water primrose (*Ludwigia hexapetala*), Lippia (*Phyla canescens*), imported fire ants (S*olenopsis invicta, S. richteri*), glassy-winged sharpshooter (*Homalodisca coagulata*), and corn rootworms (*Diabrotica* spp.).

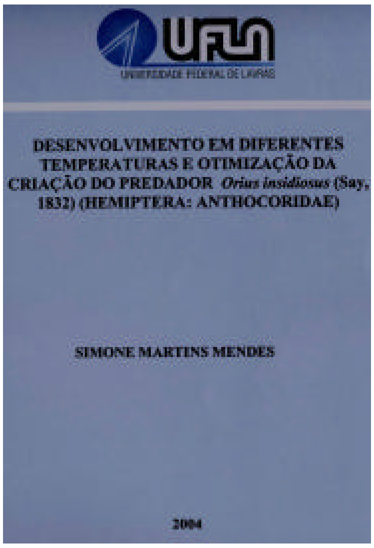
In the course of the years the SABCL has become the operations centre for many cooperative projects between South American and foreign institutions; a true operations hub for the cooperation between scientists of all over the world. Among other foreign institutions, it has carried forth projects and served as nexus not only with many ARS laboratories, but also with CSIRO, Australia; PPRI, Pretoria, South Africa; Rhodes University, Grahamstown, South Africa; U. of California, Riverside; EMBRAPA-CNPT, Brazil; EMBRAPA-Passo Fundo, Brazil; U. of Florida, Gainesville; National University of Ireland in Maynooth; U. of Wisconsin, Madison; Guelph University, Canada; U. of California, Irvine; La Molina University, Peru; U. of California, San Diego; U. of Illinois, Urbana; CABI, Delemont, Switzerland; CABI, Silwood Park, UK; Utah State University; University of Sao Paulo, Brazil; Sam Houston State University.

Apart from these formal agreements, the SABCL has been involved in scientific cooperation, in any of its forms, with innumerable scientists and scientific institutions. For the last few years the SABCL has been functioning with a permanent personnel of scientists and support employees, and a staff of trainees from the University of Buenos Aires.

Further down this bulletin we will give you an overview of its current projects. Cheers!

## 8. BIOCONTROL PROYECTS IN THE NTRS

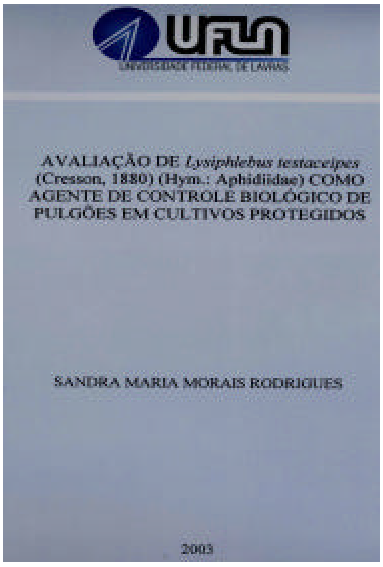
### BIOCONTROL NEWS FROM BRAZIL




**Development in different temperature and rearing optimization of the predator *Orius insidiosus* (Say, 1832) (Hemiptera: Anthocoridae). PhD Thesis of Simone Martins Mendes (Brazil), Federal University Lavras, Minas Gerais, Brazil.**

The predator *Orius insidiosus* (Say) are present in several ecosystems, both natural and managed ones, with great importance for thrips control in several crops. Thus, with the objective to answer several questions related to this predator, occurring in tropical region, and to aim at its use as biological agent, this work had as objectives evaluate the response of nymphal and adult phases at temperatures 16, 19, 22, 25, 28 and 31 ± 1°C, 70 ±10% RH and photophase 12 h; the effect of presence and absence of males on female fecundity; the preference and suitability for oviposition in structure plants as amaranth stem (Amaranthus viridis L.), common bean's stem and pod (*Phaseolus vulgaris* L.), green bean's pod (*Phaseolus vulgaris* L.) and farmer's friends inflorescence (*Bidens pilosa* L.); as well as investigate a rearing technique of O. insidious and the cost/individual production in laboratory. Eggs of *Anagasta kuehniella* (Zeller) were used as food supply. At 25°C the nymphs showed development time of 12 days, and a threshold temperatures 13.11 and 13.03°C to male and female, respectively. The thermal constant (K) for embryonic and nymphal stages were 65.5 and 46.67 days-degree, respectively. The oviposition period were 16.9, 53.4, 42.7, 36.3, 21.7 and 19.8 days at 16, 19, 22, 25, 28 and 31°C respectively, and the average number of eggs/female were 35.4; 169.6; 183.0; 206.7; 142.6 and 109. eggs at the same temperatures. The temperature of 25°C was suitable to development *of O. insidiosus* and the females showed great oviposition capacity in this temperature, to point to 25°C as preferred to the predator rearing. The best mating condition of this predator was found when the females were kept with the males until the beginning of oviposition and after mated each seven days. The farmer's friend inflorescence were the oviposition substrate preferred to O. insidiosus females, in choice and non choice tests. The rearing of the predator showed great production rates of newly-emerged adults when kept in glass pot (1.7 L of capacity) in the density 250 eggs/units, and 400 adults/unit. To predator's production in the laboratory, about 33.000 individuals/month was estimated of US$ 0.069 ( sixty and nine cents) cost/ individual.
***Information about this thesis can be obtained from*** vhpbueno@ufla.br

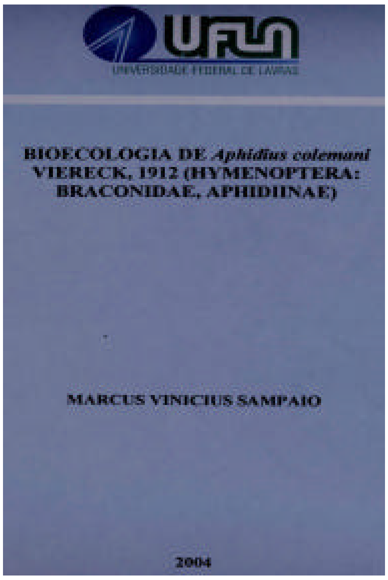
**Evaluation of *Lysiphlebus testaceipes* (Cresson, 1880) (Hym.: Aphidiidae) as an agent of biological control of aphids in protected cultivations. PhD Thesis of Sandra Maria Morais Rodrigues (Brazil), Federal University Lavras, Minas Gerais, Brazil.**




Aphids are important pests in many crops, which are difficult to control mainly due the fast development of resistance to insecticides. Therefore, during the last decades, attention has been given to researches on the natural enemies of aphids, with the intention of using them as biological control agents. Due to their host specificity and their efficiency, the parasitoids of the family Aphidiidae receive special interest *Lysiphlebus testaceipes*. The present work aimed to evaluate the influence of different on the development and parasitism of *L. testaceipes* reared on *Aphis gossypii*; to determine its life history on *S. graminum*; to evaluate the effect of storage of mummies of *S. graminum* parasitized by *L. testaceipes* at 5°C; and to evaluate the effectiveness of *L. testaceipes* to control *A. gossypii* by seasonal inoculative release on chrysanthemum crop in greenhouse. The development and parasitism of the parasitoid at different temperatures (15, 20, 25 and 30 ± 1°C) were evaluated with 30 replicates composed by four 3rd instar nymphs of *A. gossypii,* which were once attacked by *L. testaceipes*. The development periods of L. testaceipes were 26.9, 14.8, 11.3 and 12.2 days, and the emergence rates were 80, 61, 62 and 14% at 15, 20, 25 and 30ºC, respectively. The parasitism rates at 15, 20, 25 and 30ºC were 76%, 68%, 65% and 40% respectively. The temperature of 25ºC was the most appropriate for the development and parasitism of *L. testaceipes* on the aphid *A. gossypii*. The fecundity of the parasitoid was estimated by using 15 females of *L. testaceipes*. The net reproduction rate (Ro) and the intrinsic rate of increase (rm) of the parasitoid were 301.9 female and 0.513. The finite rate of increase (l), the generation time (T) and the time for duplication of population (TD) were 1.67 females per day, 11.13 days and 1.35 weeks, respectively. *L. testaceipes* has a high potential population growth when reared on *S. graminum*. The tests of mummies storage at low temperature (5ºC) were conducted with 10 treatments (control, 4, 6, 8, 10, 12, 14, 16, 18 and 20 days of storage) in 10 replicates. Forty mummies were stored at 25°C at RH 60 ± 10% and photophase 12h, and 360 mummies were stored at 5°C, RH 60 ± 10% and constant darkness. No significant differences in the emergence of *L. testaceipes* between the control test (100%) at 25ºC and 4 (80%) and 6 days of storage (80%) at 5ºC were observed. A storage period of up to 6 days of mummies of *S. graminum* parasitized by *L. testaceipes* did not show any effect on the reproductive capacity of that parasitoid. The release of *L. testaceipes* was carried out in commercial greenhouse (600 m2) at Fazenda Terra Viva, Santo Antonio de Posse, SP on cut chrysanthemum, cultivars White Reagan and Sunny Reagan. The parasitoids were released on the fourth (0.15 female/m2) and eighth week after planting (0.24 female/m2) and the aphids were sampled on ten plants per bed weekly. The population growth of *A. gossypii* on White Reagan and Sunny Reagan reached a peak in the fifth (4.5 aphids/plant) and eighth week after planting (4.0 aphids/plant), respectively. At the end of the crop 0.2 and 0.3 aphid/plant were counted, on White Reagan and Sunny Reagan, respectively. The parasitism rates, after the first and the second release of parasitoid, were 55.2 and 7.8% respectively, in White Reagan and respectively 31.9% and 10.5% in Sunny Reagan. *L. testaceipes* showed to be an effective biological control agent to control *A. gossypii* in cut chrysanthemum, in greenhouse. *L. testaceipes* could be a part of integrated pest management program in ornamental plants.

***Information about this thesis can be obtained from*** vhpbueno@ufla.br

**Bioecology of *Aphidius colemani* Viereck, 1912 (Hymenoptera: Braconidae, Aphidiinae). PhD Thesis of Marcus Vinicius Sampaio (Brazil), Federal University Lavras, Minas Gerais, Brazil.**




The parasitoid *Aphidius colemani* Viereck plays an important role on several aphid species control and has been showed a great potential for use on aphid biological control in protected cultivation. This work aimed to determine the aphid host species and the potential competitor parasitoids of *A. colemani*; to evaluate the larval competition between *A. colemani* and *Lysiphlebus testaceipes* (Cresson) in multiparasitism in the host *Aphis gossypii* Glover; the suitability and the quality of *A. gossypii, Brevicoryne brassicae* (Linné), *Myzus persicae* (Sulzer), *Rhopalosiphum maidis* (Fitch) and *Schizaphis graminum* (Rondani) as hosts for *A. colemani*; the biological aspects and thermal requirements of *A. colemani* and the changes by parasitism of *A. colemani* on *A. gossypii* at 16, 19, 22, 25, 28 and 31±1°C; and to investigate the response to different temperatures and the thermal requirements of *A. colemani* from different climatic regions of Minas Gerais state. The parasitoid *A. colemani* was found parasitizing *Aphis craccivora* Koch, *A. gossypii, Aphis spiraecola* Patch, *Rhopalosiphum padi* (Linné), *S. graminum, Toxoptera aurantii* (Boyer de Fonscolombe), *Eucarazzia elegans* (Ferrari), *M. persicae, Nasonovia ribisnigri* (Mosley) and *Sitobion avenae* (Fabricius). The parasitoid *L. testaceipes* was found as a potential competitor of *A. colemani*. On larval competition, the *parasitoid L. testaceipes* was intrinsically superior (?$^2$1GL= 15,46, P £ 0,01) to *A. colemani*. The aphid *B. brassicae* was not suitable as host for *A. colemani*. The host's quality for the *A. colemani* was decreasing according to (*M. persicae* = *R. maidis*) > *S. graminum* > *A. gossypii*. Larger hosts showed better quality than the smaller ones in size and development of *A. colemani*, but not on egg load and longevity of the parasitoid. At different temperatures, the period from oviposition to mummy formation were 11.9, 9.8, 7.7, 6.4, and 6.4 days, and the period from oviposition to adult of *A. colemani* were 19.4, 16.2, 12.6, 10.5, e 10.7 days, respectively on the interval from 16 to 28°C, and there was not mummy formation at 31°C. The threshold temperature was 5.94°C and the thermal constant was 200 day-degrees for *A. colemani*. The changes caused by parasitism on the host *A. gossypii* were minimized at 31°C. The response to temperature of *A. colemani* from different climatic regions at 16 and 28°C showed the emergence of the parasitoids from Juramento (65.9 and 35.4%) and São Gotardo (71.4 and 47.6%) were lower than the emergence found for parasitoids from Lavras (87.1 and 80.9%). The temperature more suitable to the development of the parasitoid *A. colemani* was 22°C for individuals from Juramento and São Gotardo and the 25°C for individuals from Lavras. The threshold temperatures of *A. colemani* were 4.30, 2.19 and 2.55°C, and the thermal constants were 217.39, 238.1, and 238.09 for individuals from Juramento, Lavras and São Gotardo, respectively. The effect of the competition with *L. testaceipes* and high temperatures can interfere in a negative way in the biological control of aphids using *A. colemani*.

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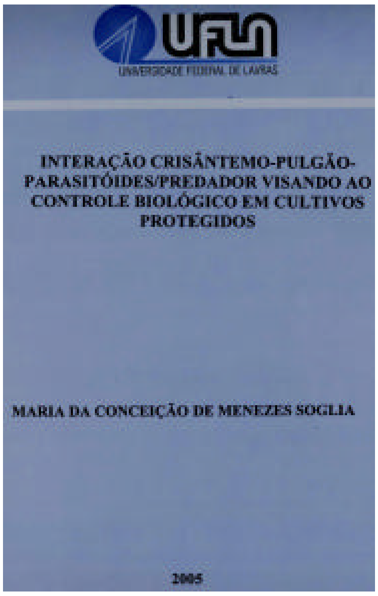
**Record and association of *Orius* and thrips species, influence of the photoperiod on the reproduction and evaluation of *Orius insidiosus* (Say, 1832) (Hemiptera: Anthocoridae) on biological control of thrips (Thysanoptera) in greenhouses. PhD Thesis of Luis Cláudio Paterno Silveira (Brazil), Federal University Lavras, Minas Gerais, Brazil.**

*Orius* Wolff (Hemiptera: Anthocoridae) species are predators of soft-bodied arthropods such as thrips, spider mites, aphids and psyllids. *Orius insidiosus* is the common species in the tropical regions. The objectives of this research were to record and to characterize the species of the genus *Orius* found at four sites of the Southeastern Brazil; to determine which plant and species of thrips these predators are associated with; to evaluate the effect of different photoperiod conditions on the reproduction of *O. insidiosus* and to evaluate the efficiency of *O. insidiosus*, through the seasonal inoculative release, on the biological control of thrips in greenhouse chrysanthemum. The survey in Lavras (MG), Campinas, Pindorama and Holambra (SP) showed the occurrence of *O. insidiosus, Orius thyestes* (Herring), *Orius perpunctatus* (Reuter) and Orius sp. Differences in male and female genitalia of the predators allowed identification of the species found. *O. insidiosus* occurred on the largest number of cultivated plants such as corn, pearl millet, sorghum, bean, sunflower, alfalfa, soybean, chrysanthemum, tango and cartamus, and in the weed such as farmer's friend (*Bidens pilosa* L.), amaranth (*Amaranthus* sp.), parthenium weed (*Parthenium hysterophorus* L.) and Joseph's coat (*Alternanthera ficoidea* L.), while the others predators species were found on weed and corn plants. A total of 14 thrips species co-exists with these species of *Orius*. The different photoperiod conditions (10L: 14E, 11L: 13E, 12L: 12E and 13L: 11E, at 25±1ºC and RH 70±10%), in witch *O. insidiosus* was kept in the pre-imaginal development (egg-nymph), and modified during adult phase, did not cause reproductive diapause in the predator females. All the females lay eggs normally during their complete lifetime. Laboratory experiments on crhysanthemum showed a decrease of the incitial thrips population with a factor 10 in six weeks in the presence of *O. insidiosus* and an increase with a factor 3,5 in the absence of the predators. In greenhouse experiments, the biological control through seasonal inoculative releases of adults and nymphs of the predator, at the rate of 2 Orius/m2 in cut chrysanthemum, showed that the predator was effective in the control of the pest. The population of thrips decreased from 4,7 to 2,5 thrips/plant in "Yellow Snowdon" and from 2,8 for 1,1 thrips/plant in "White Reagan" cultivar after the first release of the predator. After the fourth release (7,5 Orius/m2, in the total), eight weeks after the planting, the numbers of thrips reached 0,3 and 0,4 thrips/plant in "Yellow Snowdon" and "White Reagan", respectively. Thrips population was highly reduced if compared it to the first week after planting. Little thrips injury was found in the crop. *O. insidiosus* showed effective as biological control agent of thrips in greenhouse chrysanthemum. However, in the end of the crop (flowering period), the chemical control of other pests (coleopterans) interfered with the biological control of thrips. The occurrence of *Orius* species, on several cultivated plants and weeds, makes possible maintain these predators in the agro-ecosystem. *O. insidiosus* can be used for biological control of thrips in different photoperiod conditions, without effect on its reproduction. *O. insidiosus*, through the seasonal inoculative release, controlled with success the thrips population in cut chrysanthemum. However, an integrated pest management program should accompany its use, where biological control is the main pest control method.

***Information about this thesis can be obtained from*** vhpbueno@ufla.br




**Interaction chrysanthemum-aphid-parasitoids/predator seeking the biological control under protected cultivations. PhD Thesis of Maria da Conceição de Menezes Soglia (Brazil), Federal University Lavras, Minas Gerais, Brazil.**

The parasitoids *Lysiphlebus testaceipes* (Cresson), *Aphidius colemani* Viereck and the predator *Orius insidiosus* (Say) are present in several crops under greenhouse conditions, and play an important role as biological control agents. Also, plant morphologic characteristics can affect several biological parameters of these natural enemies, within the tri-trophic interactions. The objectives of this study were to evaluate the development and the parasitism of *L. testaceipes* and *A. colemani* on *Aphis gossypii* Glover, in two commercial cultivars of chrysanthemum Yellow Snowdon and White Reagan, with different trichome densities (11.3 and 16.6 trichomes/mm2 of leaf area, respectively), the influence of chrysanthemum foliar trichome densities on the effectiveness of the searching behavior of *A. colemani* on *A. gossypii*, the influence of plant/host complexes and plant in the odor response of *A. colemani*, as well as the effect of cultivars of chrysanthemum on the nymphal development, and predation and on the oviposition behavior of the predator, *Orius insidiosus*. The experiments were carried out in a climatic chamber (22±1ºC, 70±10% RH, and photophase of 12h), and in an acclimatized laboratory room (23±2ºC, 80±10% RH and photophase of 12h). The orientation behavior of experienced and inexperienced *A. colemani* females was observed using a Y-type glass olfactometer. The development time was 15.0 and 12.9 days for *L. testaceipes*, and 17.0 and 16.3 days for *A. colemani*, on the cultivars Yellow Snowdon (YS) and White Reagan (WR), respectively. The parasitism rates of *L. testaceipes* were significantly higher (68.4% and 50.0%), as compared to the parasitism rates of *A. colemani* (46.8% and 35.0%) in nymphs *of A. gossypii* reared on YS and WR, respectively. The number of contacts of *A. colemani* with the host, and of long touches with the ovipositor, increased linearly with the increment in the density of *A gossypii*, independently of the chrysanthemum cultivars. The number of short touches (probes) of *A. colemani* and the time of permanence of this parasitoid on the leaves were higher on the cultivar WR, and at the density of eight hosts. The walking activity was higher on WR. (64%), compared to YS (47%). When inexperienced and experienced *A. colemani* females were confronted with the plant/host complex or only with a non-infected plant, they preferentially orientated themselves to the source of odor originated from the *Chrysanthemum/A. gossypii* complex. When the complexes originated from *Sorghum/Schizaphis graminum* vs. alternative complex *Chrysanthemum/A. gossypii* were confronted, it was found that 64.0% of the female *A. colemani* without previous oviposition experience, oriented preferentially to their original odor complex. The chrysanthemum cultivars YS and WR did not influence neither the number of instars, nor the development of *O. insidiosus* nymphs. The consumption of aphids by the adult females of the predator was significantly higher ($p<0.01$) on WR (2.63 nymphs of *A. gossypii*) as compared to YS (0.7 nymphs of *A. gossypii*). Females of *O. insidosus* layed eggs on petioles of the two chrysanthemum cultivars with different trichome densities. The total number of eggs/ female was 23.3 and 22.5 eggs on YS and WR, respectively. Although different host plants produce a range of responses, cultivars of the same species may also differentially affect the

parasitoids/predator, through the herbivorous host *A. gossypii* in the tri-trophic interactions. The cultivars YS and WR offered feasible conditions for colonization and establishment of the predator *O. insidiosus*. The development and performance of *L. testaceipes* and *A. colemani* are influenced by the chrysanthemum cultivars where *A. gossypii* is maintained, with a lower development time and higher performance observed for the cultivar with the highest density of plant trichomes on the leaf surface. It can be concluded that the association of *L. testaceipes* and *A. colemani* as biocontrol agents and resistant chrysanthemum cultivars, in the regulation of the *A. gossypii* population, constitutes a feasible strategy for management of this crop under greenhouse conditions.
***Information about this thesis can be obtained from*** vhpbueno@ufla.br

**CITRUS BLACKFLY**

**Biological aspects of the citrus blackfly, *Aleurocanthus woglumi* Ashby 1913, and natural enemies' occurrence in the State of Pará. Project of biological control of the citrus blackfly in Pará, coordinated by Dr. Wilson José Mello e Silva Maia, Rural Federal University of the Amazonian, Belém, Brazil.**

Similar to the whitefly, the citrus blackfly, *Aleurocanthus woglumi* Ashby, is considered a quarantine pest of level A2. It is currently in five States ob Brazil, and causes damages mainly among the small locals citrus farmers. This potential citrus pest, is original of Asia, being discovered in Jamaica in 1913, reaching Cuba in 1916, Mexico in 1935 and Key West, Florida/US in 1934. It is possibly the most damaging aleirodid pest on that culture, because it affects the photosynthetic capacity of the trees, causing a damage of up to 80% in the production of fruits. The objectives of our research were to obtain biological data and identify natural enemies of this Aleyrodidae. Samples were collected in orange groves, and the biology of *A. woglumi* was studied on in *Citurs sinensis* at 25 ± 1°C, 85 ±10% RH, and photophase 12 h. The adults have a blue-gray wing coloration, with metallic hues, due to the extra-cuticular waxes that cover them. The adults present orange red body, with whitish legs and antennas. The female is larger and it measures about 1.7 mm and the male of 1,3 length mm. The fore wings, besides the predominant dark color, have small punctual stains in the medium area and a transversal line in the anal part. The eggs are laid, characteristically, in a spiral, with an average of more than 20 eggs, on the top face of the leaf. It presents an oval, prolonged, reniform shape, with a pedicel, measuring about 0,2 length mm, and being yellow clear translucent soon after the posture, becoming brown and black as the embryo grows. The embryonic period, the first, second and third instars, pupa, of pupa to the emergency and egg cycle to adult, varied from 6 to 13; 7,5 to 10,3; 7,5 to 10,1; 6,8 to 13,2; 30,1 to 38,7; 8,8 to 12,9; and 66,7 to 85,3 days, respectively. Natural enemy insects of the citrus blackfly were surveyed in the municipal districts of Pará, and we found: *Ceraeochrysa caligata* Banks, 1946; *Ceraeochrysa everes* (Banks, 1920) (Neuroptera: Chrysopidae); *Delphastus pusillus* (LeConte) (Coleoptera: Coccinellidae); *Cales noacki* Howard and *Encarsia* spp., both Hymenoptera, Aphelinidae. A Program of Biological Control of the citrus blackfly, *Aleurocanthus woglumi*, was proposed and approved for the State of Pará, especially in the areas of larger citrus production. In order to increase the actions of that Program in the State, the Ministério da Agricultura, Pecuária e Abastecimento - MAPA, liberated resources for the present year for installation of a biofactory of these four natural enemies of the fly-black, in the Laboratory of Bio-ecology of Insects - LABIN, of the Institute of Agrarian Sciences - ICA, of the Rural Federal University of the Amazonian - UFRA. Such actions seek, not only the implantation of the program, but also improvement in the effectiveness of the adoption of specific techniques,

promoting the quality of the final products (orange and lemon) offered to the consumers, and contributing to modernize the productive chain of the citrus.
***Information about this program can be obtained from www.ufra.edu.br or wilson.maia@ufra.edu.br***

**Evaluation of parasitoids and predators as biocontrol agents for pests of protected crops – Coordinator: Prof. Vanda Helena Paes Bueno – DEN/UFLA.** The system of protected crops, in other words, greenhouse production of vegetables and ornamentals, is quite an old system in many temperate countries. In Brazil this system is relatively new, although it is expanding drastically every year, and now counts with around 3,000 ha of greenhouse productions, which protect the plants and soil from rain, wind, frosts and hail, as well as marked temperature variations. These conditions, however, also benefit the occurrence of several pest insects. Aphids and thrips, particularly, are emerging as some of the most important pests in these production systems. Given the public demand for quality products, this problem causes an intensive pesticide use, sometimes on a weekly basis. This favours the appearance of insect populations resistant to the active ingredients, even those considered selective. This demands for alternative control methods that can ensure satisfactory produce quality and quantity. The consequence of this search gave great impulse to biocontrol programmes, which are now the main control methods used in many countries. This project involves the acquisition of information that supports and facilitates the use of parasitoids (Hymenoptera: Braconidae, Aphidiinae) and insect predators, genus *Orius* (Hemiptera: Anthocoridae) as biocontrol agents in protected crops, both vegetables and ornamentals. Species occurrence, influence of temperature and photophase on their biology and behaviour, and interactions between the Aphidiinae and *Orius* are some of the aspects studied in this project. So are the mass rearing and release rates in commercial cultures.
***Information about this work can be obtained from*** vhpbueno@ufla.br

**MSc. and PhD. Thesis at the Department of Entomology, Plant Pathology and Agricultural Zoology, Entomology Division, ESALQ/USP:**

**Silva, J.W.P. 2005.** Olfactory behavior of fruit flies parasitoids. MSc. Thesis, Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ/University of São Paulo, Piracicaba/SP. (Supervisor: Dr. RA Zucchi).

**Fortes, P. 2005.** Development of an artificial diet for *Nezara viridula* and *Euchistus heros* and its effect on the egg parasitoid *Trissolcus basalis*. . MSc. Thesis, Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ/University of São Paulo, Piracicaba/SP. (Supervisor: Dr. JRP Parra).

**Arruda Filho, G.P. 2005.** Morphology and biological aspects of the Harlequim beetle *Harmonia axyridis* predator of the citrus black aphid *Toxoptera citricida*. . PhD. Thesis, Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ/University of São Paulo, Piracicaba/SP. (Supervisor: Dr. E Berti Filho).

**Primiano, E.L.V. 2005.** Population dynamics of aphids in citrus trees in Nova Granada, SP. MSc. Thesis, Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ/University of São Paulo, Piracicaba/SP. (Supervisor: Dr. JRS Lopes).

**Furtado, I.P. 2006.** Sélection d'ennemis naturels pour la lutte biologique contre Tetranychus evansi Baker & Pritchard (Acari: Tetranychidae), em Afrique. Double Diplome Brazil-France, PhD. Thesis, Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ/University of São Paulo, Piracicaba/SP. (Supervisor: Dr. GJ de Moraes).

**Parra, A.L.G.C. 2006.** Isolation, identification, synthesis and field evaluation of the sex pheromone of the citrus leafminer *Phyllocnistis citrella*. PhD. Thesis, Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ/University of São Paulo, Piracicaba/SP. (Supervisor: Dr. EF Vilela).

**Domingues, G.R. 2006.** Biological control of *Phthorimaea operculella* with *Trichogramma atopovirilia* in potato fields and in stored potatoes. MSc. Thesis, Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ/University of São Paulo, Piracicaba/SP. (Supervisor: Dr. JRP Parra).

**Projects under development:**

**- Bioecology and establishment of control measures of the citrus psyllid, *Diaphorina citri*, vector of the greening disease in Brazil (Coordinator: JRP Parra, ESALQ/USP, Piracicaba, Brazil).**

This project, funded by FAPESP and the FUNDECITRUS, is aimed to approach different techniques to develop an integrated programme to control the citrus psyllid, which vectors a serious disease in Brazil. The project includes 1) the taxonomic and molecular characterization of citrus psyllids populations in Brazil (Project Leaders: RA Zucchi and FL Cônsoli, ESALQ/USP), 2) psyllid bioecology (Project leader: JRP Parra, ESALQ/USP), 3) studies of the population dynamics of the citrus psyllid (Project Leader: ), 4) the molecular characterization psyllid symbionts and their role on psyllid-plant and psyllid-parasitoid interactions (Project Leader: FL Cônsoli), 5) psyllid host plant selection behavior (Project leader: JMS Bento, ESALQ/USP), 6) Citrus resistance to psyllids (Project leaders: JD Vendramin-ESAQL/USP and AL Lourenção-IAC/SP), 7) Biological control of psyllids by entomophagous insects (Project leaders: JRP Parra and P Yamamoto-Fundecitrus), 8) Biological control of psyllids by entomopathogens (Project leader: SB Alves, ESALQ/USP), 9) Psyllid resistance to pesticides (Project leader: C Omoto, ESALQ/USP), 10) Chemical control of the citrus psyllid (Project leaders: S Gravena and P Yamamoto-Fundecitrus) and 11) Transmission of greening by psyllids (Project leader: JRS Lopes, ESALQ/USP).

**- Host-parasitoid interactions as a way of developing new strategies for insect pest control. (Coordinator: FL Cônsoli, ESALQ/USP, Piracicaba, SP, Brazil).**

This project is aimed at identifying the mechanisms parasitoids employ to regulate host development and characterize the effector molecules for the development of new strategies for insect pest control. Two systems are under investigation, the associations *Diatraea saccharalis* – *Cotesia flavipes* and *Spodoptera frugiperda* – *Diadegna* sp.

**BIOCONTROL IN PERU**

Peruvian biocontrol is mostly in the hands of the Plant Protection National Service (SENASA). We have around 50 private laboratories devoted to the production of beneficial insects, and 10 to the production of entomopathogens.

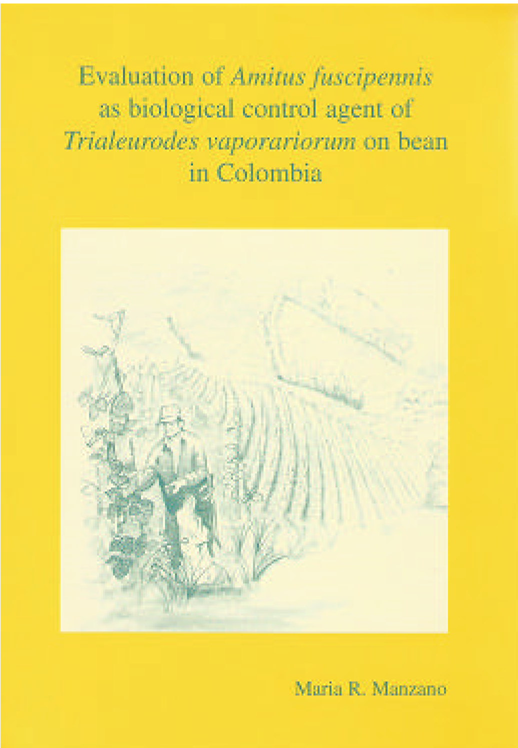
There are training courses in the production of beneficials like: *Trichogramma, Telenomus remus*, crisopas, *Orius insidiosus*, *Podisus*, *Cryptolaemus montrouzieri*, *S. barberi*, etc. Also fungi and antagonists. We keep clonies of 10 *Trichogramma* species, and 3 lacewing species, plus the folllowing hosts: *S. cerealella, E. kuehniella. G. mellonella, P. citri, S. eridania*. Finally, we keep different strains of *B. bassiana, L. lecanii, M. anisopliae, P. fumosoroseus, P. chlamydosporia; Trichoderma harzianum, T. viride, T. virens, T. stomaticum*, etc.

We have recently released *Citrostichus phyllocnistoides* from Spain for the control of *Phyllocnistis citrella*, apparently with success.

## BIOCONTROL IN COLOMBIA

Biocontrol of *Neoleucinodes elegantalis* in Solanaceae in Colombia

*Neoleucinodes elegantalis* (Lepidoptera: Crambidae) is a severe pest of tomato (*Lycopersicum escullentum*), as well as other crops in the family, such as *Cyphomandra betacea* and *Solanum quitoense*. The larva develops in the fruit, causing rotting; a single larva renders the fruit useless for commerce. Maria Manzano, Felipe Otálvaro (Universidad Nacional de Colombia, Palmira) and Ana E. Diaz (CORPOICA, Palmira) are studying on *S. quitoense* whether *N. elegantalis* uses chemical information from damaged fruit to locate its host. The pest is parasitized by *Lixophaga* sp (Diptera: Tachinidae). Another objective of the study is to determine whether *Lixophaga* sp uses information derived from the herbivorous larva, damaged fruit, droppings to locate its host larva.




**Manzano, M. R. 2000. Evaluation of *Amitus fuscipennis* as biological control agent of Trialeurodes vaporariorum on bean in Colombia. PhD thesis. Wageningen University. ISBN no. 90-5808-312-8.** The selection of biocontrol agents for insect pests should be carried forth on a scientific basis inorder to ensure that the efforts invested does not result in the choice of an ineffective agent that delays the solution of the problem. This thesis depicts the application of different agent selection approaches to determine the potential of the parasitoid *A. fuscipennis* as a regulator of populations of *T. vaporariorum* in *Phaseolus vulgaris.* Initially, biological studies on the parasitoid determined that *A. fuscipennis* would not be a satisfactory regulator of *T. vaporariorum* populations in hot and dry environments **(climatic adaptation).** The proportion of sexes was female biased since reproduction was dominated by thelytoky mediated by *Wolbachia*. This would simplify and facilitate the mass production of the parasitoid, that could otherwise be complicated by its long life cycle, given that it prefers to oviposit on the I and II instars of *T. vaporariorum* **(rearing method).** The **reproductive potential** of the parasitoid and the pest were measured under different %RH and T (?C), and the $r_m$ was found to always be superior to that of *T. vaporariorum*. In addition to the reproductive superiority of the parasitoid over the pest, it was important to find out how it located the infested plants, and determine its **search behaviour**. Apparently, *A. fuscipennis* was not attracted by long distance signals, and once on the plant it deployed a restricted area search, as fits a parasitoid that attacks aggregate hosts as is the case of *T. vaporariorum*. In adition, it walked fast and oviposited on the majority of the hosts it came across. The **natural field parasitism** of whiteflies for *A. fuscipennis* in warm areas was low compared to *Encarsia nigricephala*. Although on one hand the natural populations of both parasitoids were reduced by the use of insecticides, they reduced the initial populations of whiteflies, helping *E. nigricephala* in its regulation. This suggests that parasitoid and pesticides could be successfully combined in an IPM programme in beans. The global results strongly support that *A. fuscipennis* is a good candidate for the control of *T. vaporariorum*.

**BIOCONTROL IN ARGENTINA:** PARASITOID OF CARPOCAPSA IN PATAGONIA

The parasitoid *Goniozus legneri* was detected in the province of Río Negro by INTA personnel. In March, 2004, el INTA began the rearing of this parasitoid on *Carpocapsa* larvae, and other pest species.

More information: Dra. Liliana Cichón, Ing. Darío Fernández, Ing. Silvina Garrido, INTA Alto Valle, (02941) 453501/2, sgarrido@correo.inta.gov.ar, dfernandez@correo.inta.gov.ar

LOOKING TO IMPROVE BIOCONTROL OF THE HOUSE FLY

The Instituto de Microbiología y Zoología Agrícola (IMYZA) del INTA Castelar, Buenos Aires province, Argentina, has been implementing a management plan against filth flies for several years, combining parasitoid releases, cultural control and sound production practices and infrastructure. The institute has recently started to test 19 strains of entomopathogenic fungi to add to these techniques. A suspension of *Beauveria bassiana* spores in the fly diet eliminated 90% of the flies.

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NATURAL ENEMY OF *DIAPHORINA CITRI* IN ENTRE RIOS, ARGENTINA

The pest leafhopper of cirtrus, *Diaphorina citri*, Kuwayama, was found in the northwest of the province of Entre Ríos in 1994, being the first record of the pest in Argentina. This insect is a dangerous vector of Huanglongbing (ex Greening), the man disease of citriculture in the world. The parasitoid *Tamarixia radiata* (Waterston) (Hymenoptera: Eulophidae) was found in 2005.
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**BIOCONTROL NEWS FROM MEXICO**

XXIX NATIONAL BIOCONTROL CONGRESS

The 29th Biological Control National Congress took lace in Manzanillo, Colima, from November 5 to 10, 2006. As a preamble, they held the 17th National Biocontrol Course, with the assistance of national and foreign experts. The agenda covered: biosecurity, biocontrol of agricultural pests and diseases, and patents in biocontrol. Four workshops were also held: 1) Release of entomophagous insects; 2) Entomopathogenic fungi applications; 3) GIS applied to pest and disease data analysis; and 4) Digital photography applied to biocontrol. During the congress, 156 posters and talks were delivered; and the symposia "Biocontorl of *Aedes aegypti*, vector of dengue"; "Phytosanitary priorities in the cultures of *Agave tequilana*"; "Biocontrol of the fall armyworm"; and "Entomopathogenic Nematodes" were held. The event was organized by the Centro Nacional de Referencia de Control Biológico of the Plant Protection Agency (Federal Government), Universidad de Colima, the State of Colima, and the Produce-Colima Foundation.

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BIOCONTORL PROGRAMME OF THE PINK HIBISCUS MEALYBUG

The pink Hibiscus mealybug (*Maconellicoccus hirsutus*) is a severe problem in Bahía de Banderas, Nayarit and Puerto Vallarta, Jalisco, MEXICO, consequently the Mexican Government, through its National Biocontrol Reference Centre (Centro Nacional de Referencia de Control Biológico-Dirección General de Sanidad Vegetal), is implementing a programme based on the predator *Cryptolaemus montrouzieri* (Coleoptera: Coccinellidae) and the parasitoid *Anagyrus kamali* (Hymenoptera: Encyrtidae). Between 90 and 95% control levels have been achieved through this programme. To date, over 5,800,000 insects have been released: 4,580,000 predators and 1,312,000 parasitoids. Due to this success, authorities established a *A. kamali* production laboratory in Bahía de Banderas, Nayarit, with the capability to produce 4 million individuals per month.

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## 9. OVERVIEW OF THE SABCL BIOCONTROL PROYECTS

As was mentioned in a previous section, the SABCL, in Hurlingham, Buenos Aires, is a small but active laboratory. Although it is well known to most biocontrol scientists in Argentina, its existence and activities have probably not been publicized to workers in other parts of Latin America. In this section we will present a brief overview of its current activities.

The waterhyacinth, *Eichhornia crassipes* (Mart.) Solms-Laubach (Pontederiaceae), is considered one of the worst weeds worldwide, due to its economic, social and environmental impact. We have currently three natural enemies under evaluation as biocontrol candidates: the dolichopodid fly *Thrypticus truncatus* Bickel & Hernández, the dictyopharid *Taosa inexacta* (Walker) and the delphacid *Megamelus scutellaris* Berg.

Another important aquatic weed on our tray is *Alternanthera philoxeroides* (Amaranthaceae). Like waterhyacinth, it has been under study for many years, and several natural enemies have been released against it worldwide. However, new candidates are under study in order to obtain further control in areas where the former have not been successful. *Systena nitentula* Bechyné (Chrysomelidae: Alticinae), *Phenrica litoralis* (Bechyné) (Chrysomelidae: Alticinae) and *Clinodiplosis alternantherae* Gagné (Diptera: Cecidomyiidae) are currently being studied as possible biocontrol candidates.

Brazilian pepper, *Schinus terebinthifolius* Raddi (Anacardiaceae), is a perennial tree native to Argentina, Brazil and Paraguay. It was introduced in the US in late XIX century as ornamental. It is mentioned in Hawaii, Florida and the Bahamas as one of the most significant invasive plants. A large list of natural enemies has been put together, of which we are currently concentrating efforts on an Eriophyoid mite, *Tecmessa elegans* Schaus (Lepidoptera: Noctuidae), and an undescribed Thysanoptera.

Fanwort, *Cabomba caroliniana*, native to the southern Neotropics, is considered a weed in Canada, the U.S., Australia, Japan, Southeast Asia, New Guinea, China, and India. No specific natural enemies have been cited, only a few generalists. We are concentrating research efforts on two potential candidates, a shoot feeding moth in the genus *Paraponyx* (Lepidoptera: Pyralidae), and a Bagoini weevil *Hydrotimetes natans* Kolbe, that has stem mining larvae.

*Egeria densa* Planchon, is a South American rooted, perennial, submerged plant in the Hydrocharitaceae, the same family as two other relevant genera of noxious aquatics: *Hydrilla* and *Elodea*. We are currently working on an undescribed shore fly in the genus *Hydrellia* (Diptera: Ephydridae). The larvae mine the leaves, feeding on the mesophyll and causing the bleaching of whole branches.

Lippia, *Phyla canescens* (Kunth) Greene (1899) (Verbenaceae) is a fast-growing, mat-forming plant. It is widespread and native to South America (southern Ecuador, Perú, Chile, Argentina, Uruguay, Paraguay and Bolivia). It was introduced into Australia as an ornamental in late nineteenth century and is now considered a major threat to biodiversity, riparian areas, conservation and grazing systems. So far, *Cercospora* cf *lippiae* (widespread and damaging) and *Colletotrichum* spp. appear promising natural enemies, as do a Cicadellidae and a Chrysomelidae, both as yet unidentified.

Other projects we have recently undertaken are the emerging weeds *Cardiospermum grandiflorum* (Balloon vine), *Campuloclinium macrocephalum* (Pompom weed) and *Pereskia aculeata* (Barbados gooseberry). Field surveys and host specificity studies of the following agents are underway: **Balloon vine:** The phytophagous microhymenoptera *Lisseurytomella flava* and a Cecidomyiidae gall midge; **Pompom weed:** Host specificity of the thrips *Liothrips* sp. was evaluated through laboratory tests and field surveys; **Barbados gooseberry:** we are after the stem-boring moth, *Maracayia chlorisalis*.

The Imported Fire Ant (IFA) Project started at the SABCL in 1988 to evaluate natural enemies of native fire ants as candidates for the biological control of the red and black imported fire ants, *Solenopsis invicta* Buren and *S. richteri* Forel, respectively, in the US. **Microsporidia:** New surveys and tests were conducted for *Thelohania solenopsae* Knell, Allen and Hazard and *Vairimorpha invictae* Jouvenaz and Ellis. ***Pseudacteon* flies:** several species of these amazing decapitating parasitoids have been released in the U.S. New surveys revealed the occurrence of *P. obtusus* in Patagonia and several species in Bolivia. Activity pattern in two sites in Corrientes is reported and phylogeny is in progress. ***Solenopsis daguerrei*:** this is a cleptoparasite of fire ants, a smaller ant in the same genus that doesn't have workers, and "cheats" the fire ant workers to tend their brood. Genetic studies of populations of several locations in Argentina are being conducted. ***Orasema xanthopus*:** this is a hymenopteran parasitoid that oviposits outside the nest on diverse plants. It showed low plant preference for oviposition. **Nematodes:** several colonies were found infected with a mermithid nematode, infected workers do not sting. **Viruses:** Surveys were intensified and samples shipped to CMAVE. **Studies on local fire ants**: Surveys are being conducted to identify the source population of *S. invicta* in the US and the occurrence and distribution of fire ant species in western Argentina. Morphological, chemical and molecular techniques are being applied.

The introduction of the glassy-winged sharpshooter (GWSS), *Homalodisca coagulata* (Say) (Hemiptera: Cicadellidae: Cicadellinae: Proconiini), into southern California in the 1990's has resulted in the outbreak of Pierce's disease in grapes producing millionaire losses. Surveys performed using sentinel eggs of *Tapajosa rubromarginata* yielded the egg parasitoid *Gonatocerus tuberculifemur* (Hymenoptera: Mymaridae), of great promise.

The Diabroticina are a large group of American Chrysomelidae that include such pests as corn rootworms, cucumber beetles, and bean leaf beetles. Limitations in the effect and use of traditional soil pesticide applications, call for new approaches in the management of these pests. Cucurbitacins (tetracyclic triterpenoids from cucurbits), have a strong feeding stimulant effect on this group of insect, for which we have been studying them as ingredients for toxic baits and traps. The sexual bias in the beetles recorded both from punctual cucurbitacin sources (traps and trap cloths), and small area applications of a toxic bait indicate that in either case the males are much more susceptible to control by means of cucurbitacins, but at large scale applications this effect is minimized so as to make the bait a valid control tool.

For more details on the SABCL's background and current work, please visit www.usda-sabcl.org.

## 10. MINUTES OF THE IOBC/NTRS MEETING IN RECIFE, BRAZIL, AUGUST 7, 2006

### First Meeting of the Governing Board (GB), Advisory Board (AB) and IOBC Global

Participants: Vanda Bueno, Fernando Consoli, Miguel Zapater, José Parra, Hugo Arredondo y Joop Van Lenteren. Observer: Manuel Amaya

-The launch of the NTRS web site and the newsletter publication on scheduled dates were considered high priority.

- The NTRS web site design and maintenance will be coordinated by Dr. Fernando Consoli. It will be edited in Spanish and English.
- NTRS newsletters will come up on biannual basis with editions on June 15 and December 15. Dr. Willie Cabrera W. will be in charge. To achieve this goal he will prepare a draft to gather input from the members of the GB and AB.
- A growing need for an active participation of the members of the GB, the AB and representatives in national congresses and meetings of all regional countries, in the form of communications, explanatory panels, descriptive triptychs, mini-courses and small symposia was perceived.
- The formation of regional working groups will be strongly endeavoured. Though all GB members would strive to this mission, Dr. Miguel Zapater proposed that Dr. María Manzano be responsible for the coordination.
- The importance of identifying members' needs to make the NTRS helpful was highlighted. Individuals with certain level of responsibility in the NTRS will be encouraged to become members.
- Any scheme that members of the GB or the AB , or other category members are willing to perform on their own and in favour of the RS will be encouraged, as long as it does not impinge on the organization's finance and that has the GB's approval. For instance, Hugo proposed to coordinate a board of NTRS biofactories. Another interesting suggestion was that of developing a complete database.
- The designation of representatives for each country of the NTRS was also pointed out as a relevant issue. Accordingly, Miguel will continue to prepare the pertaining documentation and submit it to the GB. Some concrete proposals are underway, such as the ones presented to Brazil.
- The AB will prepare a report to be submitted to the GB concerning membership fees and requirements for next year.
- Cooperation activities and a joint congress with Mexico was proposed.
- Financial sources will be sought after identifying the tasks and activities to be developed.
- The next GB meeting was agreed to be held in Brasilia during the upcoming SICONBIOL that will take place in June, 2007 to facilitate members' attendance.

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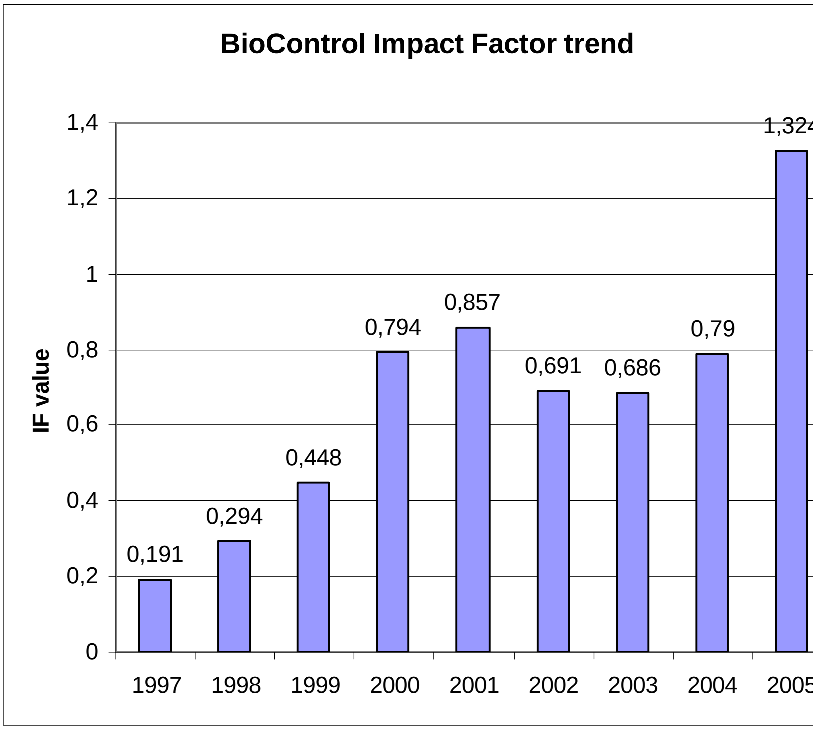
## 11. IOBC GLOBAL JOURNAL BIOCONTROL

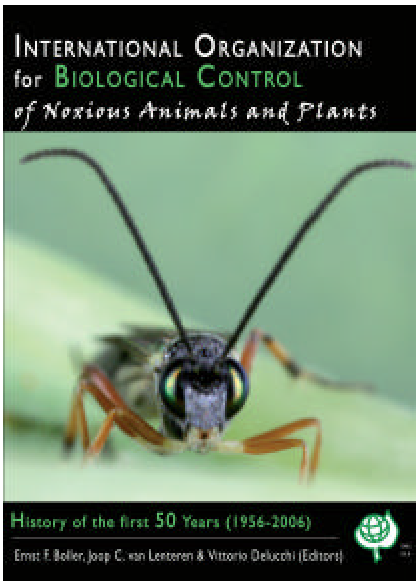

### Goodbye Heikki Hokkanen – Welcome Eric Wajnberg

Since the initiation of IOBC in 1956, the organization has had its own scientific journal, first named Entomophaga which changed after 42 volumes into BioControl in 1998 with volume 43 (for detailed information about Entomophaga, see Appendix III.2). A Management Board of 6 members was appointed and Heikki Hokkanen (Finland) was appointed as Editor in Chief. The Editorial Board consisted of 8 associated editors covering different areas of biological control. A contract with Kluwer Academic Publishers (Dordrecht, The Netherlands) was finalised. In 2005 a new agreement was signed with Kluwer/Springer after a process of consultation with the Regional Sections, the Executive Committee of Global and the management board of BioControl. From January 2007, a new Editor in Chief (Eric Wajnberg, France), will replace Heikki Hokkanen. Heikki deserves IOBC'S gratitude for making BioControl a first class peer reviewed international scientific journal!!

The current situation of BioControl is very healthy. Many manuscripts of excellent quality are submitted, the rate of rejection of manuscripts is in the order of 65%, though the number of pages per volume has been increased several times. A system of "publication on line first" will soon be in place and authors can publish additional material related to an article on the website of BioControl. One of the most important achievements of the Heikki Hokkanen and his team of associate editors is to have increased the Citation Index of the journal strongly during the 8 years history of BioControl.

## 12. PUBLICATIONS AND BOOKS ON BIOCONTROL

If you miss important recent books on biological control or IPM, send us (colazza@unipa.it) a jpeg picture of the front page, a short summary and information on how and where the book can be ordered. Also, please send us pdf files or reprints of important new biocontrol publications and they will be mentioned in the next issue of our newsletter.





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**Preface**

The International Organization for Biological Control of Noxious Animals and Plants (IOBC), is celebrating its 50th anniversary this year. This provides us with an excellent opportunity to publish a historic review, to complement the various meetings that have been organised worldwide. The mission of IOBC is to promote the development of biological control and its application in integrated control programmes, where biological control means the use of living organisms or their products to prevent or reduce the losses or harm caused by pest organisms (or, in short, the use of biota to control biota). During the past 50 years, IOBC has been an effective advocate of biological control, applying its considerable influence as an independent, international, professional body to assist policy making in FAO, EU, OECD, World Bank and other international lending banks, NGOs and national agricultural and environmental ministries.

The first official plenary session of IOBC took place on 20 November 1956 in Antibes, France, after ideas had been expressed to establish an international organisation of biological control at the 8th International Congress of Entomology in 1948 in Stockholm, where experts in this field met under the auspices of and supported by the International Union of Biological Sciences (IUBS). At that time, ecologists and entomologists had serious concerns about environmental and health effects of chemical pest control, and they considered biological control an important potential alternative for pesticides. Biological control was, of course, not new to science. The first description of use of biological control dates from around 300 AD, when predatory ants were used for control of pests in citrus orchards in China, a method which is still used today in Asia. "Modern" application of biological control started in 1888, when an entomologist set sail from San Francisco for Australia to collect natural enemies for the control of the exotic cottony cushion scale insect in citrus. He was successful in finding natural enemies and sent a total number of 129 Vedalia beetles to California. These predatory beetles were propagated and by June 1889, more than 10,000 adult beetles had been distributed throughout the infested citrus areas. In a little more than a year after the accidental release of the scale pest, its populations had collapsed throughout most of the infested Californian citrus regions. After this project, many successes followed and several large national organisations for development of biological control programmes were created.

In continental Europe, however, biological control was practised in few countries and there by only a small number of researchers. Therefore, at the IUBS meeting in Stockholm in 1948, it was thought necessary to combine the skills of these relatively small national research groups in Europe under the umbrella of an international organisation. This resulted in the IOBC, which was originally a mainly European affair. The formation of numerous working groups resulted in excellent work and several important European biological control and integrated pest management (IPM) projects, and later integrated plant protection (IPP) projects were developed and implemented. In 1971, IOBC Global was established and the European group became one of the six Regional Sections which represent the world's major biogeographical zones. The activities of the various Regional Sections have evolved differently, but experiences in certain regions have helped developments in other regions. IOBC Global profited considerably, for instance, from 15 years of IOBC experience in Europe. The same can be said about the Working Groups. With its global network of collaborating scientists, IOBC now has the status of a dependable, professional organisation providing objective information about biological control and IPM. We expect that the IOBC will continue to play an important role in realizing sustainable and environmentally friendly food production worldwide. In those areas where we currently see overproduction of food (e.g. Europe, North America, Australia and New Zealand) we foresee that biological control will be used increasingly because it contributes to the maintenance or augmentation of biodiversity, and also because consumers appreciate pesticide-free food. In these areas, biological control will be the corner-stone of Integrated Protection and Production of food. In areas where food production does not yet meet demands, biological control can be used to reduce the production costs, increase production, contribute to improved health and safety of farmers, and a cleaner environment.

As we celebrate IOBC, it is worth noting some of its remarkable features:

• An international organisation without permanent staff, without permanent physical headquarters, without permanent offices and (up to 2006) without official archives;
• An organisation with high international reputation and low budget, financed by official institutional members, individual and supporting memberships whilst remaining fully independent;
• An organisation run on a voluntary and honorary basis by a motivated community of independent scientists, university teachers and field advisers;
• An international organisation with a long tradition and reputation as a trend-setter, identifying, addressing and developing emerging future fields of interest in the context of a sustainable agriculture;
• An effective and influential organisation without professional public relation managers and marketing departments.

In summary it is an organisation where the contents of the package were always more important than the wrapping paper. Frequent changes in the composition of executive committees of IOBC Global and the Regional Sections has made it difficult to summarise the history of such a colourful and highly stimulating organisation, as there were no archives to consult. In preparation of this review, the editors have invested considerable time to collect, to read and to analyse both published and unpublished documentation from around the world. These facts and figures were augmented by anecdotes and eye-witness reports. The editors themselves provided overlapping continua of personal experience in IOBC management, since 1956 in the case of Vittorio Delucchi, since the late 1960s in the case of Ernst Boller and since the early 1970s in the case of Joop van Lenteren. It was indeed this strongly individual, and hence transient, knowledge of IOBC's history that influenced the decision taken in 2005 to start a systematic collection of historic traces and personal reflections, and to create from these a permanent IOBC archive in Switzerland.

Many colleagues have made most valuable contributions to this book either by adding interesting details to Parts I to VII, or by writing short historic reviews of individual IOBC Commissions and Working Groups presented in Appendix I to III of this book. In reading all these texts, you will discover another interesting characteristic of IOBC: its linguistic diversity. The vast majority of persons actively involved in IOBC activities do not communicate in English as their mother tongue, but in 30 or more different languages.

Inevitably, the effort to communicate during international meetings and through written contributions in IOBC publications has created an unorthodox but lively "IOBC English" which captures the flavour of the authors' own culture and geographic regions. Transmitting the content has always been more important than striving for linguistic perfection. Therefore, following a long IOBC tradition, we as editors of this book have refrained from linguistic polishing of the individual contributions but have intervened discretely where errors could have led to serious confusion.

As many abbreviations of organisations and countries have been used in this book we have added a list of acronyms in Appendix IV to facilitate reading

We would like to thank everyone involved in the collection of materials and writing of the various chapters. A particular word of thanks is due to Nina Fatouros and Tibor Bukovinszky, both of the Laboratory of Entomology, Wageningen University in the Netherlands), who designed the cover of this book.

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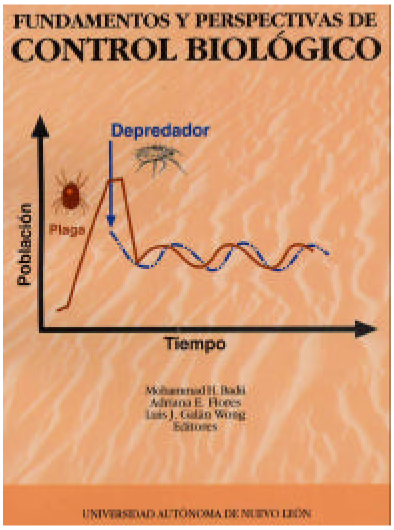
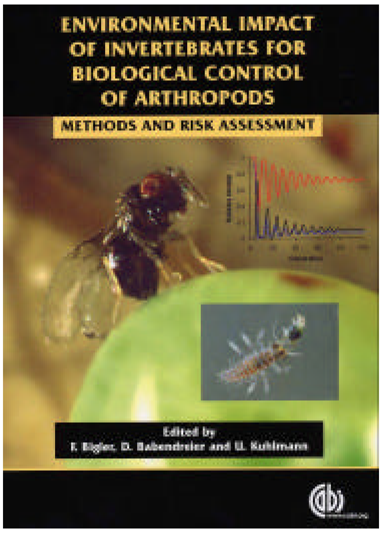
**Durable Crop Protection: policy for crop protection towards 2010. Anonymous, 2005. Ministry of Agriculture, Nature and Food Quality, The Netherlands.** (Report can be downloaded from www.minlnv.nl).

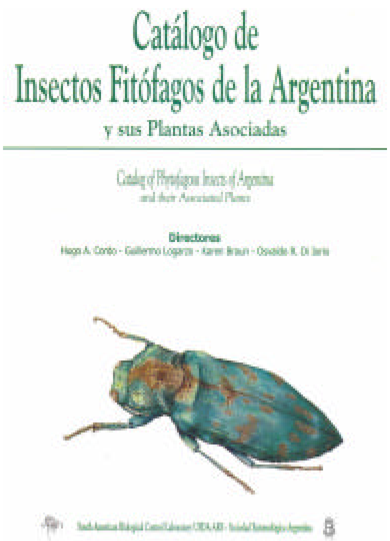
The Dutch Government has been attempting to change crop protection form pure chemical control to integrated pest management since the 1980s. Initially, it published the Crop Protection Plan in 1984, which resulted in a change of crop protection philosophy at the research and policy level, but as clear policy goals lacked it did not dramatically change application of chemical control. In 1989 the Multi-Year-Crop-Protection Plan was published, which specified in detail where, how and when a reduction could be realized for each of the crops grown in Holland. This plan resulted in a 50% reduction in pesticide use by volume and a complete reorganization of crop protection research. All research had to be IPM oriented, and many new projects that involved biological control were financed. The next step was published in 1999 policy plan for the period 2000-2010 "Integrated Management, the way ahead", which aimed at a further strong reduction of chemical pesticide dependence and a strong increase in use of integrated pest management methods. This policy plan was recently adapted and renamed to "Durable Crop Protection: policy for crop protection towards 2010". The main goal is a reduction in environmental pollution due to pesticides by at least 95% compared to 1998. The approach for obtaining this goal is the application of true integrated crop protection (a method in which all alternative non-chemical pest control methods are first considered before chemical pesticides are used). Growers/farmers have to keep a log-book in which they motivate which crop protection methods they use, and why they need chemical control if applicable. Growers/farmers have to evaluate the following possibilities when designing their durable crop protection plan: possibilities to prevent pest including use of plants that are resistant to the pest, use of cultural methods, application of warning systems, use of non-chemical crop protection methods including biological control, and as a last step chemical control.




**Fundamentos y Perspectivas de Control Biológico. Badii, M.H., A.E. Flores & L.J. Glan Wong (eds.) 2000. Universidad Autónoma de Nuevo Leon, México, 462 pages ISBN: 970-694-033-2.**
A very complete book of biological control in Spanish. The 34 chapters cover the basic scientific aspects of biocontrol (ecology, taxonomy, behaviour, population dynamics) as well as applied aspects (quarantine, mass production), case studies and a glossary. For information, contact: mhbadii@yahoo.com.mx

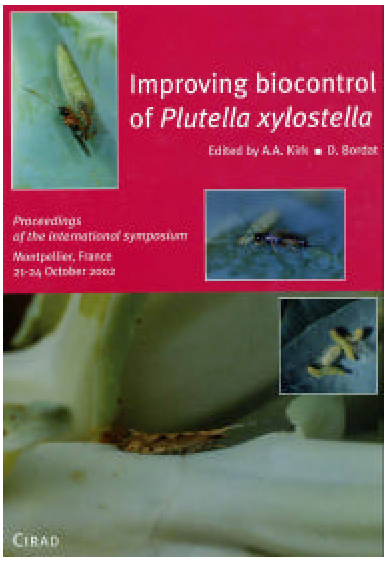



**Environmental Impact of Invertebrates for Biological Control of Arthropods: Methods and Risk Assessment; Edited by F. Bigler, D. Babendreier and U. Kuhlmann. CABI, Wallingford, Oxon, UK, 2006.**
Classical biological control of insects, where exotic natural enemies are introduced to control exotic pests, has been applied for more than 120 years, and the release of natural enemies has resulted in the permanent reduction of at least 165 pest species worldwide. Augmentative biological control, where exotic or native natural enemies are periodically released, has been used for 90 years, and more than 150 species of natural enemy are available on demand for the control of about 100 pest species. This book responds to the growing need to assess non-target impacts of biological control agents. The aim is, first to compile the current knowledge of methodologies used for assessing environmental impacts of invertebrate biological control agents and, secondly, to advise on how to perform science-based risk assessments which might be required for future regulation of such organisms. This book will be of significant interest to the scientific community involved in biological control and integrated pest management, but also for commercial companies producing biological control agents, for risk assessors and for regulatory authorities around the world.




**Catalog of Phytophagous Insects of Argentina and their associated plants. H.A. Cordo, G. Logarzo, K. Braun, O.R. Di Iorio (eds.), South American Biological Control Laboratory, USDA-ARS, Sociedad Entomológica Argentina.**
Not strictly a biocontrol book, this work is, however, the most comprehensive and updated catalogue of insect-host plant associations for southern South America. It

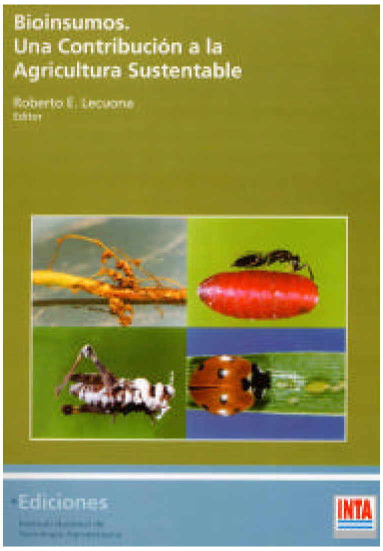
can be accompanied by the revised posthumous work of the great José Pastrana, the catalogue of Argentine Lepidoptera, **Los lepidópteros Argentinos, sus plantas hospedadoreas y otros sustratos alimenticios**.
For information, contact: gcabrera@speedy.com.ar




**Improving biocontrol of Plutella xylostella. Editors A.A. Kirk & D. Bordat. Proceedings of the international symposium. Montpellier, France, 21-24 October 2004.**
*Plutella xylostella* (DBM) is the most cosmopolitan of pests and has spread, in part naturally by wind aided movement, and by the hand of man, to all those parts of the planet where crucifers are grown as crops or exist as wild plants. It is resistant to many pesticides and some biologically based toxins. Hence biological control has been used both as a component of IPM programs designed to manage *Plutella* and on its own to reduce DBM populations to an acceptable level. The results have been varied, with good success in some areas and complete failure in others. How can the biological control of DBM be improved?

Keynote speakers presented reviews on the current status of *Plutella* in different parts of the world, pathogens as biocontrol organisms, and classical systematics of parasitoids. The different topics are arranged into 7 chapters beginning with the status and role of Hymenoptera in biological control of DBM (Chapter 1) which discusses Hymenoptera as biocontrol agents and reviews current parasitoid taxonomy. Chapter 2 discusses the role of entomopathogens in DBM biological control . The review covers each pathogen group, advances achieved and their contribution to the biocontrol of DBM. Chapter 3 reviews biological control of DBM in Africa where although ranked as the most destructive crucifer pest, yield loss information is lacking. Very high parasitoid diversity was recorded from South Africa and current biocontrol work in Africa is discussed. Chapter 4 reports on the biocontrol of DBM in South and Central America. DBM causes immense damage to crucifers in the region and the review highlights attempts to control it using biocontrol and selective insecticides which conserve biocontrol agents. The North America review, (Chapter 5) points out that DBM belongs to a complex of pests attacking crucifers. A dynamic approach including the conservation and introduction of biocontrol agents would improve overall management of DBM. The review of biocontrol of DBM in Asia (Chapter 6) highlights the region wide approach to management of DBM. Some of the most successful IPM and classical biocontrol programs have been carried out in Asia. However continued use of ineffective insecticides is the greatest challenge to biocontrol in the area. Chapter 7 reviews biocontrol of DBM in the Oceania region. Despite good control of DBM by introduced agents in New Zealand and Australia continued use of insecticides and subsequent resistance has led to crop failures recently. A report on the workshop sessions constitutes chapter 8 in this book. Recommendations included improving taxonomic methods using on-line keys and genetic characterization, improved exchange of information and dependable methods for rearing and applying biological control agents, and faster registration of biopesticides.

In addition a further 26 proceedings contributions make up the rest of the publication. The quality of them is very high and many are from areas little represented at mainstream meetings.




**Bioinsumos: Una Contribución a la Agricultura Sustentable. Lecuona, R.E. (ed.), 2004. Ediciones Instituto Nacional de Technologia Agropecuaria, 58 pp.** Booklet providing information about all categories of natural enemies (predators, parasitoids and pathogens), antagonists of diseases and composting; with illustrations. In Spanish.

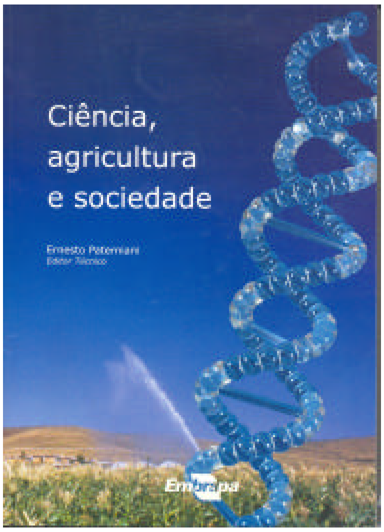

**Control Biológico: Especies entomófagas en cultivos agrícolas. Molinari, A.M., 2005. Ediciones Instituto Nacional de Tecnología Agropecuaria, 80 pp.** Nicely illustrated booklet giving an overview on beneficial organisms (predators, parasitoids and pathogens). Surprisingly with advertisements of chemical control companies. In Spanish.

**Pinto, AS, Nava, DE, Rossi, MM, Malerbo-Souza, DT. (editors). 2006. Controle Biológico de Pragas na Prática. Piracicaba, CP-2, 2006. 287pp. (ISBN 85-60409-00-9) Contact: AS Pinto –** [aspinn@uol.com.br](mailto:aspinn@uol.com.br).


The book has 23 chapters dealing with the use of natural enemies in applied biological control, which were written by more than 50 specialists from different Brazilian research institutions and companies commercializing natural enemies in Brazil. Contents: 1. Applied biological control in Brazil, 2. Parasitoids and predators in biocontrol, 3. Microorganisms in biocontrol, 4. Entomopathogenic nematodes in biocontrol, 5. Biological control of wheat pests, 6. Biological control of sugarcane pests, 7. Biological control of *Spodoptera frugiperda* in Brazil, 8. Biological control of pests in soybean, 9. Biological control of the mite *Mononychellus tanajoa*, 10.

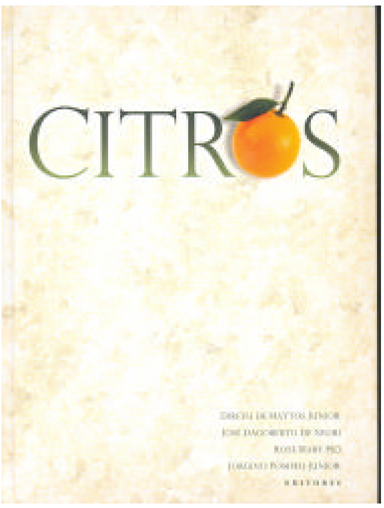
Biological control of citrus pests, 11. Biological control of fruit tree pests, 12. Biological control of tomato pests, 13. Biological control of coffee pests, 14. Biological control of forest pests, 15. Applied biological control of the two spotted mite in greenhouses: viability in the use of predatory mites, 16. Genetic modified plants and the biological control, 17. Pheromones and the biological control, 18. Selectivity of pesticides to natural enemies, 19. Biological control and pollination: is there a relationship?, 20. Aspects of the biological control of the main plant hoppers of sugarcane in Brazil, 21. Commercialization of *Trichogramma* in Brazil, 22. Adding the in vitro rearing system of natural enemies in the applied biological control, 23. Perspectives of the biological control in Brazil.

**Paterniani, E. (editor) 2006. Science, Agriculture and Society (In Portuguese). EMBRAPA Informação Tecnológica, DF. 503pp. (ISBN 85-7383-335-1). Contact**: vendas@sct.embrapa.br




The multi-authored 14 chapters of this book were written by 32 well-known researchers from the major Brazilian research institutions, and are aimed to all of those directly or indirectly interested in agriculture, those in charge of agricultural political decisions and the society in general, as the benefits of development of more efficient agricultural practices are addressed. Contents: 1. From the beginning to the modern days: a brief history of agriculture, 2. Contributions to the plant genetic improvement in Brazil, 3. Advances in the integrated pest management in Brazil, 4. Micronutrients and heavy metals – essentiality and toxicity, 5. Genetic engineering in agriculture, 6. Conquering the Cerrado and the consolidation of the agropecuary, 7. Direct planting: a revolution in the Brazilian agriculture, 8. Integration of farming-pecuary: a case study from Embrapa Rice and Beans, 9. Cultivated plains: a huge potential to produce "quality" with emphasis on bean crops, 10. The Brazilian Agribusiness, 11. The family property and the agropecuary research, 12. Recent progress in forestry, 13. Agriculture in the Amazon region, 14. Limitations in the application of research data in tropical agriculture.

Mattos Jr, D., de Negri, J.D., Pio, R.M., Pompeu Jr., J. (editors). 2005. Citrus (In Portuguese). Instituto Agronômico and Fundag, Campinas. 929pp. (ISBN: 85-85564-09-1). Contact: Centro Apta Citros Sylvio Moreira-IAC, Rod. Anhaguera, km 158, 13490-970, Cordeirópolis, São Paulo, Brazil. (phone: +55 (19) 3546-1399).

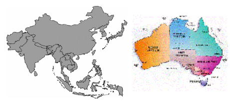



This is the most complete publication on citrus I have even seen. It could be called the "Citrus Bible" as it covers in detail all of the aspects of the citrus, starting with a historical review of the origin and distribution of this important plant, going through all of the aspects of plant taxonomy and varieties availability, planting technology and traits, disease and pest management, harvesting, processing and quality control, ending with a final discussion on research and development in citriculture. One of the chapters “Integrated Pest Management in Citrus” by P. Yamamoto and J.R.P. Parra provide an in depth review and discussion on this issue, devoting two sessions to biological control, one on conservation and the other on classical and applied biological control.

## 13. IOBC REGIONAL SECTIONS: ADDRESSES AND INFORMATION

**Information provided below about regional sections of IOBC is limited, most information is regularly updated on our website www.IOBC-Global.org.**

### ASIA AND THE PACIFIC REGIONAL SECTION (APRS)



**President**: Dr. Eizi Yano, National Agricultural Research Center for Western Region, Fukuyama, Hiroshima, 721-8514, Japan.
Email: yano@nara.kindai.ac.jp
**Vice Presidents**: Dr. Fang-Hao Wan, Biological Control Institutue, Chinese Academy of Agricultural Sciences, Beijing, P.R. China. Email: wanfh@cjac.org.cn
Dr. Suasa-Ard, Director of the National Biological Control Research Center (NBCRC), Central Regional Center (CRC) at Kasetsart University, Nakhon Pathom, Thailand. Email:agrwis@ku.ac.th
**Secretary/Treasurer**: Dr. Takeshi Shimoda, Insect Biocontrol Lab., National Agricultural Research Center, 3-1-1, Kannondai, Tsukuba, Ibaraki, 305-8666 Japan. Tel:+81-29-838-8846, Fax:+81-29 838-8837. Email: oligota@affrc.go.jp
**Past President**: Dr. Rachel McFadyen, Australia. Email: Rachel.mcfadyen@dnr.qld.gov.au

APRS will soon organize the election of the next Executive Committee.

### AFROTROPICAL REGIONAL SECTION (ATRS)

**President**: Dr. James A. Ogwang, Biological Control Unit, Namulonge Agricultural Research Institute, Kampala, Uganda. Email: jamesogwang@hotmail.com
**Past President**: Dr. H.G. Zimmermann, Agricultural Research Council, Plant Protection Research Centre, Weeds Research Division, Pretoria, South Africa. Email: riethgz@plant2.agric.za
**Vice-President**: Dr. Charles O. Omwega, International Centre of Insect Physiology and Ecology, Nairobi, Kenya. Email: comwega@icipe.org
**General Secretary**: Dr. M.P. Hill, ARC PPRI, Private Bag X 134, Pretoria 001, South Africa.
Email: riethgz@plant2.agric.za
**Treasurer**: Dr. J. Ambrose Agona, Post Harvest Program, Kawanda Agricultural Research Institute, Kampala, Uganda. Email: karihave@starcom.co.ug

IOBC Global is organizing a symposium at the next Congress of Entomology in Durban about biocontrol in Africa.

### EAST PALEARCTIC REGIONAL SECTION (EPRS)

**President**: Dr. Istvan Eke. Budapest, Hungary. Email: Ekei@posta.fvm.hu; istvan.eke@freemail.hu

**Vice Presidents**: Dr. Danuta Sosnowska. Institute of Plant Protection, Department of Biocontrol and Quarantine, 60-138 Poznan, Miczurina Str. 20, Poland.
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Dr. Vladimir Nadykta (Institute of Biocontrol, Krasnodar, Russia)
**General Secretariat**: Dr. Yury Gninenko and Dr. E. Sadomov, Russia

## NEARCTIC REGIONAL SECTION (NRS)

**President**: Robert N. Wiedenmann, Center for Economic Entomology, Illinois Natural History Survey, 607 East Peabody, Champaign IL 61820, USA. Email: rwieden@uark.edu
**Vice-President**: Nick Mills, University of California, Berkeley, CA 94720, USA. Email: nmills@nature.berkeley.edu
**Secretary-treasurer :** Stefan T. Jaronski, USDA ARS NPARL, 1500 N. Central Ave., Sidney, MT 59270 USA. Email: sjaronski@sidney.ars.usda.gov
**Corresponding Secretary**: Susan Mahr, Dept. of Entomology, University of Wisconsin, Madison WI 53706, USA. Email: smahr@entomology.wisc.edu
**Past-President**: Molly S. Hunter, Department of Entomology, University of Arizona, Tucson AZ, USA. Email: mhunter@ag.arizona.edu
**Members-At-Large**: Jacques Brodeur, Dept de Phytologie, Universite Laval, Sainte-Foy, Quebec, Canada. Email: jacques.brodeur@plg.ulaval.ca; George Heimpel, Department of Entomology, St. Paul, MN 55108, USA. Email: heimp001@tc.umn.edu; Sujaya Rao Department of Entomology, Oregon State University, Corvallis, USA. Email: sujaya@science.oregonstate.edu

Next meeting of NRS will be held during the ESA meeting

## NEOTROPICAL REGIONAL SECTION (NTRS)

**President**: Prof.dr. Vanda .H.P. Bueno, Department of Entomology/UFLA, P.O.Box 3037, 37200-000 Lavras, MG, Brazil.
Email: vhpbueno@ufla.br
**Secretary General**: Dr. Willie Cabrera Walsh, South American Biological Control Laboratory, Agricultural Counselor American Research Service Laboratory, USDA--ARS, U.S. Embassy–Buenos Aires. Unit 4325, APO AA 34034–0001.
Email: gcabrera@speedy.com.ar
**Treasurer**: Dr. Luis Devotto, Avda. Vicente Méndez 515, and Instituto de Investigaciones Agropecuarias (INIA), Chillán, Chile. Email: ldevotto@inia.cl
**Vice President 1**: Dr. Maria Manzano, Universidad Nacional de Colombia, sede Palmira, Colombia.
Email: mrmanzano@palmira.unal.edu.co
**Vice President 2:** Dr. Mary M. Whu Paredes, Enrique León García N° 527. Urb. Chama-Surco. Unidad de Producción de Insectos Benéficos del Programa Nacional de Control Biológico del Servicio Nacional de Sanidad Agraria -SENASA Lima-Perú. E-mail: mwhu@senasa.gob.pe
**Vice President 3**: Dr. Leopoldo Hidalgo, Centro Nacional de Sanidad Agropecuaria (CENSA), Carretera a Tapaste y 8 vías, Apartado 10, CP 32700, San José de las Lajas, La Habana, Cuba.
Email: lhidalgo@censa.edu.cu

**President Elect**: Prof.dr. F. Consoli, Department of Entomology, Fitopatologia e Zoologia Agrícola, ESALQ. Universidade de São Paulo, Av. Pádua Dias 11, Piracicaba, SP 13418-900, Brazil. Email: fconsoli@esalq.usp.br
**Past President**: Dr. Raquel Alatorre, Mexico. Email: alatoros@colpos.mx

## WEST PALEARCTIC REGIONAL SECTION (WPRS)

**NEW Executive Committee was elected in September 2006:**
**President**: Dr. F. Bigler, Switzerland, email: franz.bigler@fal.admin.ch
**Vice Presidents**: Prof.dr. Sylvia Blümel (Austria), Dr. Heidrun Vogt (Germany), Prof. Dr. L Tirry, University of Gent, Laboratory of Agrozoology, Department of Crop Protection, Gent, Belgium. Email: luc.tirry@ugent.be
**Secretary General**: Dr. Philippe Nicot(INRA, Avignon)
**Treasurer**: Prof. Dr. R. Albajes, Universita de Lleida, Centre Udl-IRTA, Lleida, Spain. Email: ramon.albajes@irta.es

This Section of IOBC has always been one of the most active and has an excellent website with all information on working groups, meetings and bulletins: www.iobc-wprs.org. This website also has PDF files of the WPRS newsletter **PROFILE**, providing all recent information about IOBC WPRS.

# 14. PUBLICITY AND ADS



**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*.