EUROPEAN BIOLOGICAL CONTROL LABORATORY USDA-ARS

Montferrier-sur-Lez, France (UE)

September 06 - 07, 2011

D. COUTINOT in 2010
The XXIII Brazilian Congress of Entomology

Congress proceeded in Natal
in the State of Rio Grande Norte, Brazil
(05° 47' 42" S and 35° 12' 32" W)

2.300 people from all Brazil States

15 others countries

Scientific program

29 lectures, 41 round tables, 3 symposiums,

2400 posters, 80 oral presentations and

40 student defenses.

195 research scientists (34 foreigners),

98 research Institutes, 68 Brazilian Institutes,

30 foreign Institutes were present during the congress.

Round table organized and animated by Fernando Consôli

IMPORTATION AND APPLICATION OF NATURAL ENEMIES FOR BIOLOGICAL CONTROL – IS IT A ROCKY ROAD?

F. Consoli, D. Coutinot, J. Parra, J. Briano, L.A. Nogueira de Sá
(Left to right)

Article in preparation
Importation and application of natural enemies for biological control – Is it a rocky road?
Neotropical Entomology

D. Coutinot (EBCL Montpellier, France USDA-ARS)
Visit to Embrapa Environment, Jaguariúna city & Campinas (SP)

"Costa Lima" Quarantine Laboratory with Dr. Maria Conceição Peres Young Pessoa

Eucalyptus and *Glycaspis brimblecombei*
(Hemiptera: Psyllidae)
and the emergence of the encyrtid parasitoids from Australia.

Plant Quarantine Laboratory & Botanic Garden of the Campinas Agronomic Institute
Dr. Renato Ferraz de Arruda Veiga

IAC Plant quarantine

IAC Seed collection and Insectproof greenhouse

Crédit photo © D. COUTINOT

Dominique COUTINOT - Brazil 2010

The trip in 2010 was possible because of the international expertise of

Dan STRICKMAN
EBCL Interim Director, Acting Director, Overseas Biological Control Laboratories, National Program Leader Veterinary, Medical, and Urban Entomology, USDA, Agricultural Research Service

Ladislau Martin NETO
Coordinator of Embrapa Labex USA, USDA-ARS/OIRP

Ryan MOORE
USDA/Agricultural Research Service, Office of International Research Programs (USDA)

The travel expenses of the trip were paid by Embrapa Labex USA
And in Fiscal Year 2011
an exchange will bring a Brazilian scientist to Montpellier and the U.S., funded by ARS.

Solutions from Nature
EBCL
European Biological Control Laboratory

Embrapa
Ministry of
Agriculture, Livestock
and Food Supply

BRAZILIAN GOVERNMENT
BRASIL

September 6 to 7, 2011

Visit of EBCL (USDA-ARS)
Montpellier, France (EU)

Luiz Alexandre Nogueira de Sá

Laboratório de Quarentena "Costa Lima"

Embrapa Meio Ambiente, Jaguariúna-SP, Brazil

lans@cnpma.embrapa.br

Embrapa Ministry of Agriculture, Livestock and Food Supply

BRAZILIAN GOVERNMENT BRASIL

Luiz Alexandre Nogueira de Sá
Laboratório de Quarentena "Costa Lima", Embrapa Meio Ambiente, Jaguariúna-SP, Brazil
Email lans@cnpma.embrapa.br

B.S. degree in Agronomy at UNESP

(University of the State of São Paulo) (1975)

M.S. at UNICAMP (State University of Campinas) (1982)

Ph.D at USP (University of São Paulo) (1991)

Pos-Ph.D in Spain at UPC (Universidad Politécnica de Cartagena) (2001-2002)

Biology and biological control of pests

AGENDA for Luiz Alexandre Visite

- **Tuesday 6** **10h30 – 12h00**

Luiz Alexandre Nogueira **de Sá**

"Classical Biological Control of Pests in Brazil and Brazilian Quarantine Facilities"

- ***14h00 – 17h30***

Dominique Coutinot

"Introduction to law, International European and French disposals for the Import and Export of Living Material for Scientific Purposes"

- **Wednesday 7** **09h00 – 12h00**

Dominique Coutinot

« Quarantine – Technical Practical Legal Aspects »

- **14h00 – 16h00**

EBCL Quarantines Tour

- **16h30 – 19h00**

Luiz Davidovich Conference at Agropolis International

"The strategic Brazil in research, higher education and mobility: a challenge for cooperation"

Classical Biological Control of Pests in Brazil and Brazilian Quarantine Facilities

Dr. Luiz Alexandre Nogueira de Sá

Brazilian Enterprise for Agricultural Research
Quarantine Laboratory "Costa Lima"
Embrapa Environment
Brazil

Foto: Don Hwan Choe (UGA1295001)

AGRICULTURAL RESEARCH
INNOVATION · QUALITY OF LIFE

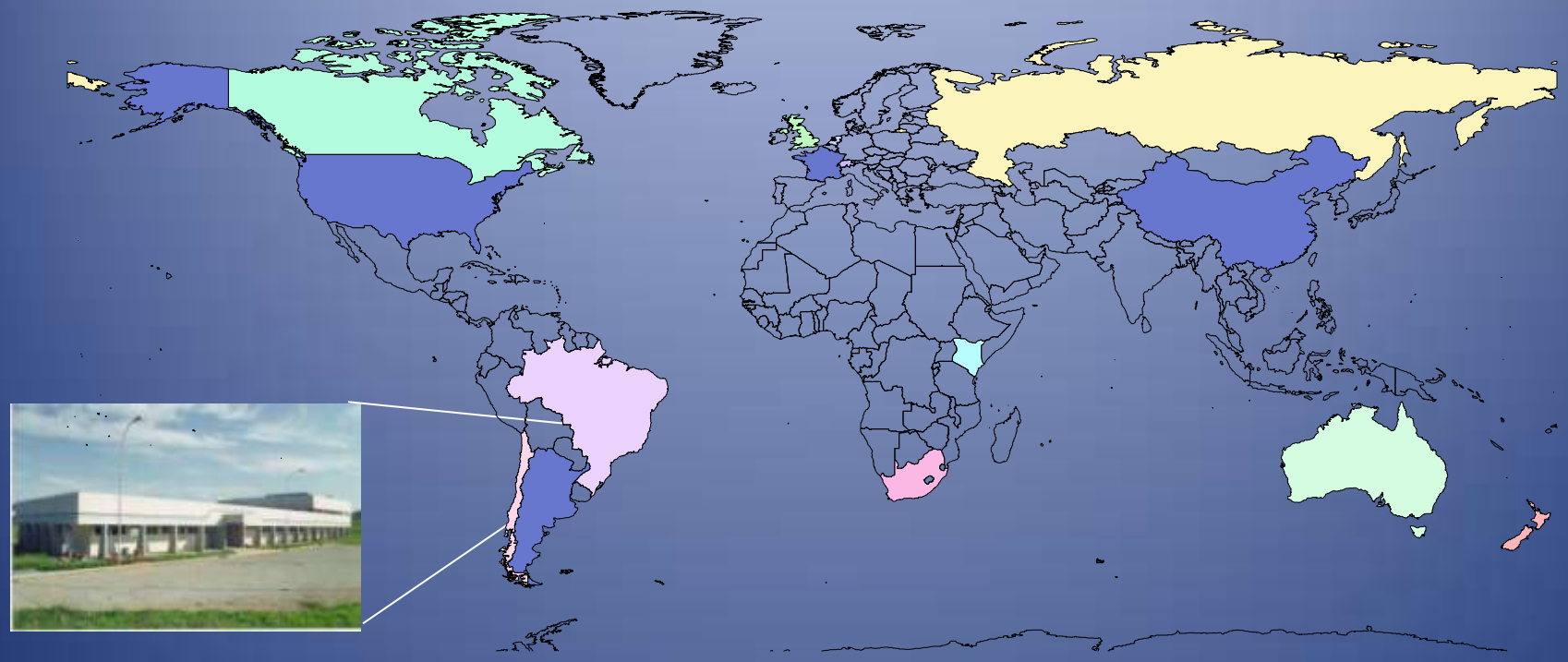
Embrapa

Ministry of
Agriculture, Livestock
and Food Supply

BRAZILIAN GOVERNMENT
BRASIL

Interchange of commodities between different countries promotes introductions of exotic species

THE QUARANTINE FACILITIES OF BIOCONTROL AGENTS WORLDWIDE



Legend

- Russia
- Switzerland
- Kenya
- New Zealand
- England
- The Netherlands
- South Africa
- Argentina
- Australia
- Brazil
- Canada
- Chile
- China
- The United States of America
- France

Quarantine Laboratories of Biological Control Agents (BCA) in Mercosur

Chile

Since 1936 in the Instituto de Investigaciones Agropecuarias (INIA), Centro Nacional de Entomologia La Cruz, La Cruz V Region

Quarantine Laboratories of BCA in Mercosur

Argentina – three laboratories

- Insectario de Investigaciones para Lucha Biológica (IILB), at Instituto Nacional de Tecnologia Agropecuária (INTA), Castelar - Buenos Aires

- Centro de Investigaciones para la Regulación de Publicaciones de Organismos Nocivos (CIRPON), Tucumán

- South American Biological Control Laboratory, USDA-ARS, Buenos Aires

Peru - Lima

Laboratorio de Cuarentena

Ministerio de Agricultura

Servicio Nacional de Sanidad Agraria - SENASA

Quarantine Laboratory
"Costa Lima“
Embrapa Environment
Jaguariuna - SP
Brazil

Plant Quarantine Laboratory Embrapa
Genetic Resources and Biotechnology
Brasília - DF
Brazil

Quarantine Laboratory "Costa Lima"

International Interchange and Quarantine of Biological Control Agents (BCA)

Quarantine Laboratories of BCA in Mercosur

Brazil

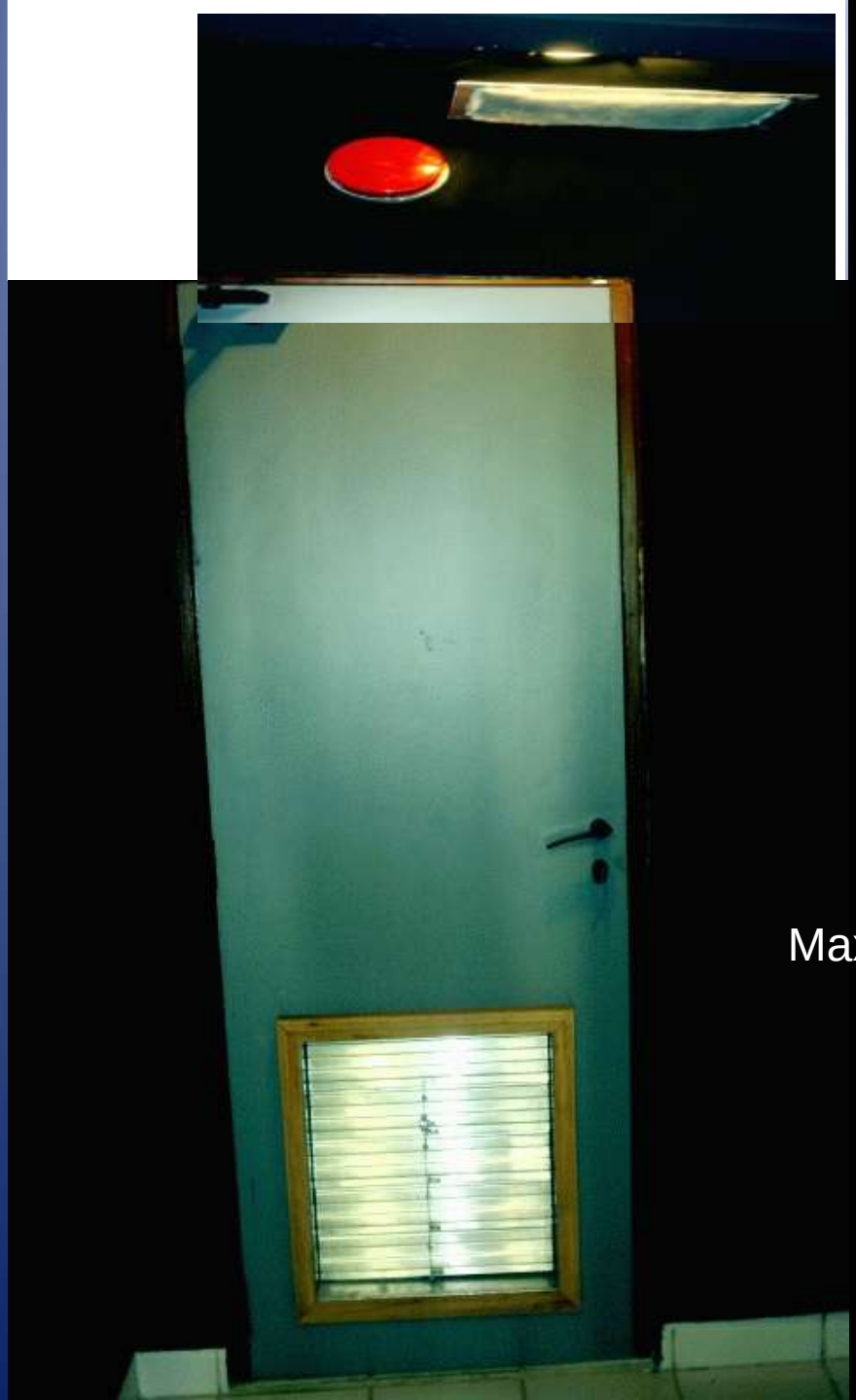
Accredited since 1991

Total Area – 950 m^2

Security Quarantine area – 180 m^2

Common quarantine area - 770 m^2

Maximum security area



Maximum security area

Quarantine Laboratory "Costa Lima"

General attributions:

- interchange and quarantine of exotic natural enemies
- taxonomical confirmation of introduced species
- keep voucher of introduced species
- promote ideal conditions for organisms
- ensure release of contaminant free organisms
- guarantee security of each introduction
- promote campaigns of public awareness

"Costa Lima" laboratory's Voucher species collection

REQUIREMENTS FOR EXCHANGE NATURAL ENEMIES IN BRAZIL

- for the importation of natural enemies in Brazil fill in the appropriate form:

“REQUIREMENT FOR BIOLOGICAL MATERIAL IMPORTATION

- for the exportation of natural enemies from Brazil fill the appropriate form:

“CITES”

PROCEDURE FOR IMPORTATION IN QUARANTINE FACILITIES

Technical assessment of importation requests

↓

Issue the importation permission

↓

Procedures of organisms in quarantine

↓

- Contaminants separation
- Indentification of organisms
- Specificity of host
- Study of indirect effects of organisms

- Expedition of organisms for liberation
- Follow-up of introduction processes for two years

Table 1. Number of species introduced, objective and crop and the destined states in Brazil. From 1991 to 2011

Organisms	Number of species	Objectives and Crops	States
Mite	10	Stored grains, cassava, apple, vegetables	BA, SP, SC, MG, RS, PR;
Bacteria	119	Seeds, antiserum, taxonomy, soy bean, cactus, sugar cane, diagnostic kit	AM, DF, SP, PR, SE, BA, RS, MG, RS, RJ;
Fungus	79	Biofertilizers, morfological characterization, human consumption, cocconut, enzymes, cassava, forage, plant diseases, seeds, heavy metals, soy bean, antimicrobial, cattle, taxonomy, industry, laboratory tests	DF, SP, PR, CE, RJ;

Table 1. Number of species introduced, objective and crop and the destined states in Brazil. From 1991 to 2011

Organisms	Number of species	Objectives and Crops	States
Predador	2	Tomate, citrus;	SP, BA;
Parasitoid	20	Sugar cane, tomato, fruits, cassava, coffee, corn, forests, citrus, laboratory tests	SP, PE, BA ES, PR, MG;
Nematode	8	Soil pests, forests, laboratory tests, molecular, biochemical and morphological characterizations	SP, PR, DF;
Virus	1	Corn	PB

Table 1. Number of species introduced, objective and crop and the destined states. From 1991 to 2011

Organisms	Number of species	Objectives and Crops	States
Protozoan	1	Biological control of *Aedes aegypti;*	DF
Ant	1	Fire ant for parasitoid specificity test	SP
Total	241		

Fonte: Tambasco et al., 1997, 2001, 2003 e Sá, 2011

Introduced Biological control agents From November 1991 to December 2010

Parasitoids

Natural enimies	Target organisms
Xanthopimpla stemmator	*Diatraea saccharalis*
Apanteles gelechiidivorus	*Tuta absoluta*
Diachasmimorpha longicaudata	*Anastrepha* sp
Epidinocarsis diversicornis	*Phenacoccus herreni*
Acerophagus coccois	*P. herreni*
Aenasius vexans	*P. herreni*
Cephalonomia stephanoderis	*Hypothenemus hampei*
Trichogramma atopovirilia	*Spodoptera frugiperda*
Pediobius furvus	*Diatraea saccharalis*
Megarhyssa nortoni	*Sirex noctilio*
Rhyssa persuasoria	*Sirex noctilio*
Ageniaspis citricola	*Phyllocnistis citrela*
Phymastichus coffea	*H. hampei*

Introduced Biological control agents from November 1991 to December 2010

Predatory mites

Natural enimies	Target organism
Phytoseiulus persimilis	*Tetranychus urticae*
Typhlodromus pyri	*Panonychus ulmi*
Typhlodromalus tenuiscutus	*Mononychellus tanajoa*
Amblyseius californicus	*Mononychellus tanajoa*
Typhlodromus annectens	*Mononychellus tanajoa*
Amblyseius andersoni	*Panonychus ulmi*
Acarophenax lacunatus	*Rhyzopertha dominica*

Introduced Biological control agents From November 1991 to December 2010

Predatory insects

Natural enemies	Target organism
Podisus maculiventris	*Tuta absoluta*
Chryptolaemus montrouzieri	*Cochonilhas algodoadas*

Nematodes

Natural enimies	Target
Steinernema carpocapsae	*Cosmopolites sordidus*
Deladenus siricidicola	*Sirex noctilio*

Microrganisms

Natural enimies	Target organisms
Hirsutella thompsonii var. *thompsonii* Cepas: - HtMOR, HtM3 e HnC83	*Eriophyes guerreronis*
Hirsutella thompsonii var. *synnematosa* Cepa: - HtM5	*Eriophyes guerreronis*
Neozygites floridana	*Mononychellus tanajoa*
Trichoderma harzianum	Biological control test *Gliocladium virens* in plant deaseses
Duddingtonia flagrans	reductions of verminosis in ruminants

Number of exported species of benefical organisms, objective and crop, and destined countries. From 1991 - 2009

Organisms	Number of species	Objective and Crop(s)	Importing countries
Parasitoids	19	greenhouse, golf courses, laboratory studies, fire ants	Holanda, Japan, USA;
Predadory mites	7	Cassava	Africa, Colombia
Fungus	1	Laboratory studies, cassava	Africa, Colombia
Total	**27**		

Fonte: Tambasco et al., 2001, 2003; Sá, 2009

Exportation of predatory mites

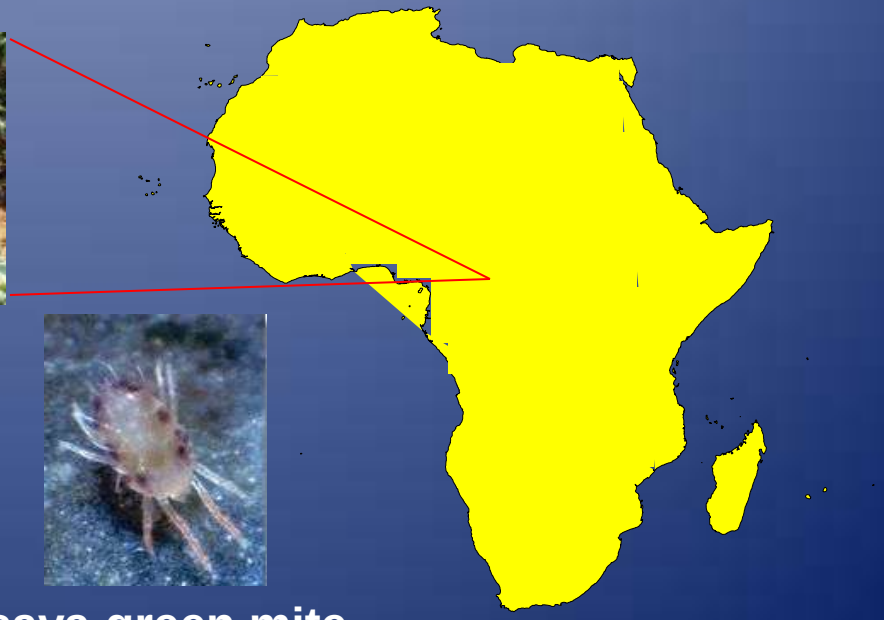
Neoseiulus idaeus*, *Thyphlodromalus manihoti* e *Typhlodromalus aripo

CIAT Centro Internacional de Agricultura Tropical

Embrapa

International Institute of Tropical Agriculture

***Mononychellus tanajoa* introduced accidentally in Africa in 1970**



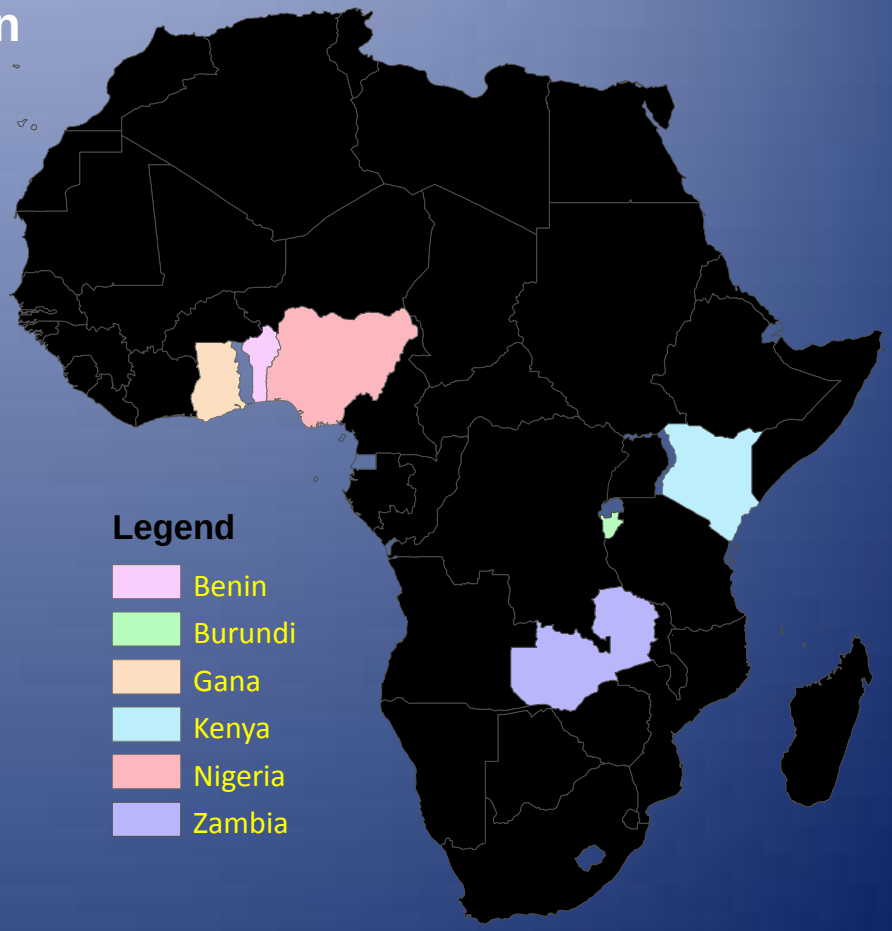
Cassava green mite

Exportation of predatory mites

N. idaeus **e** ***T. manihoti*** **introduced in Benin, Gana, Kenia e Zambia in 1989/90**

T. aripo **introduced in Benin in 1995**

Settled reducing the population of ***M. tanajoa*** **in up to 60%**



International Information System on Biological Control

Available on line

http://www.cnpma.embrapa.br/biocontrol

Discussion List

Biocontrol-l

The aim of this list is to discuss subjects related to research, legislation, extension services and education in biological control

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Send messages to the list, addressing to

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Exotic Pest

Eucalyptus Redgum Lerp Psyllid

Glycaspis brimblecombei **Moore (Hemiptera: Psyllidae)**

Adult

Nymph

Exotic Pest

Glycaspis brimblecombei

Leaf of *Eucalyptus* sp. with shells, nymphs and eggs of *G. brimblicombei*

Leaves of *Eucalyptus* sp. infested by *G. brimblicombei*

Exotic Parasitoid

Psyllaephagus bliteus **(Hymenoptera: Encyrtidae)**

Bronze bug

Thaumastocoris peregrinus

Carpintero & Dellapé

(Hemiptera: Thaumastocoridae)

Foto: Luiz A Feitosa

Eggs of bronze bug

Foto: P. J. Ferreira Filho

Nymphs of bronze bug

Bronze bug on *Eucalyptus*

Thaumastocoris peregrinus

Foto: Luiz A Feitosa

Adult females

Foto: Luiz A Feitosa

Adult males

Bronze bug on *Eucalyptus*

Thaumastocoris peregrinus

Foto: Luiz A Feitosa

Infestations of adults and nymphs of the bronze bug on Eucalyptus leaves

Foto: LQCL

Leaves whitening and bronzing on Eucalyptus tree

Bronze bug

Thaumastocoris peregrinus

Fonte: Tree Protection News, dec 2008

Exotic parasitoid

Clerucoides noackae
(Hymenoptera: Mymaridae)

Dr. Simon A. Lawson
Team Leader Forest Health
Queensland Primary Industries and Fisheries
Department of Employment, Economic Development and Innovation
Australia
E-mail Simon.Lawson@deedi.qld.gov.au

Blue Gum Chalcid

Leptocybe invasa Fisher & LaSalle

(Hymenoptera: Eulophidae)

Fonte: C. F. Wilcken, 2008

Adult female of *L. invasa*

Fonte: C. F. Wilcken, 2008

Damages of the blue gum chalcid on the branches of *Eucalyptus camaldulensis x E. grandis.* Northest of Bahia State, Brazil, in 2008

A) galls on the midrib of *Eucalyptus* leaves;

B) galls showing exit holes of the wasp *L. invasa;*

Exotics parasitoids

Aprostocetus, Quadrastichus complex

(Hymenoptera: Eulophidae)

and

Megastigmus (Hymenoptera: Torymidae)

FIGURES 1–3. Habitus. 1. *Quadrastichus mendeli* ♀; 2. *Selitrichodes kryceri* "dark" specimen ♀; 3. *Selitrichodes kryceri* "light" specimen ♀

Fonte:IL-KWON KIM et al, 2008

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Agricultural Research Organization
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Israel
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Exotic Pest

Citrus leaf miner

***Phyllocnisits citrella* Stainton (Lepidoptera: Gracillariidae)**

Adult

Pre- pulp

Citric cancro disease

Introdution of the parasitoid

Ageniaspis citricola *Logvinovskaya*

(Hymenoptera: Encyrtidae)

Embrapa

Meio Ambiente

USP ESALQ

Fundecitrus
FUNDO DE DEFESA DA CITRICULTURA

Gravena
MANEJO ECOLÓGICO de PRAGAS AGRÍCOLAS

Exotic Pest

Citrus psyllidae

Diaphorina citri Kuwayama (Hemiptera: Psyllidae)

Adult vector of Greening Disease

Source: www.fundecitrus.com.br/doencas/greening.html

Exotic Parasitoid

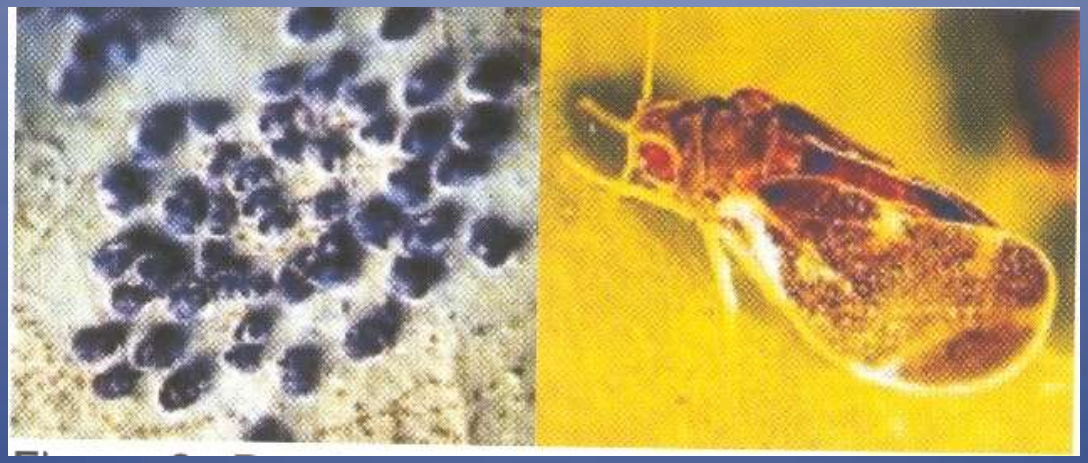
Tamarixia radiata
(Waterston)
(Hymenoptera: Eulophidae)

Source: http://plantpro.doae.go.th/plantclinic/clinic/plant/pummelo/greening.htm

Exotic Pest

Citrus black fly

***Aleurocanthus woglumi* Ashby**
(Homoptera:Aleyrodidae)



Pulps and adult of the citrus black fly

Photo: Maria Regina Vilarinho de Oliveira

Citrus orchard infested by *Aleurocanthus woglumi* with fumagine on the leaves

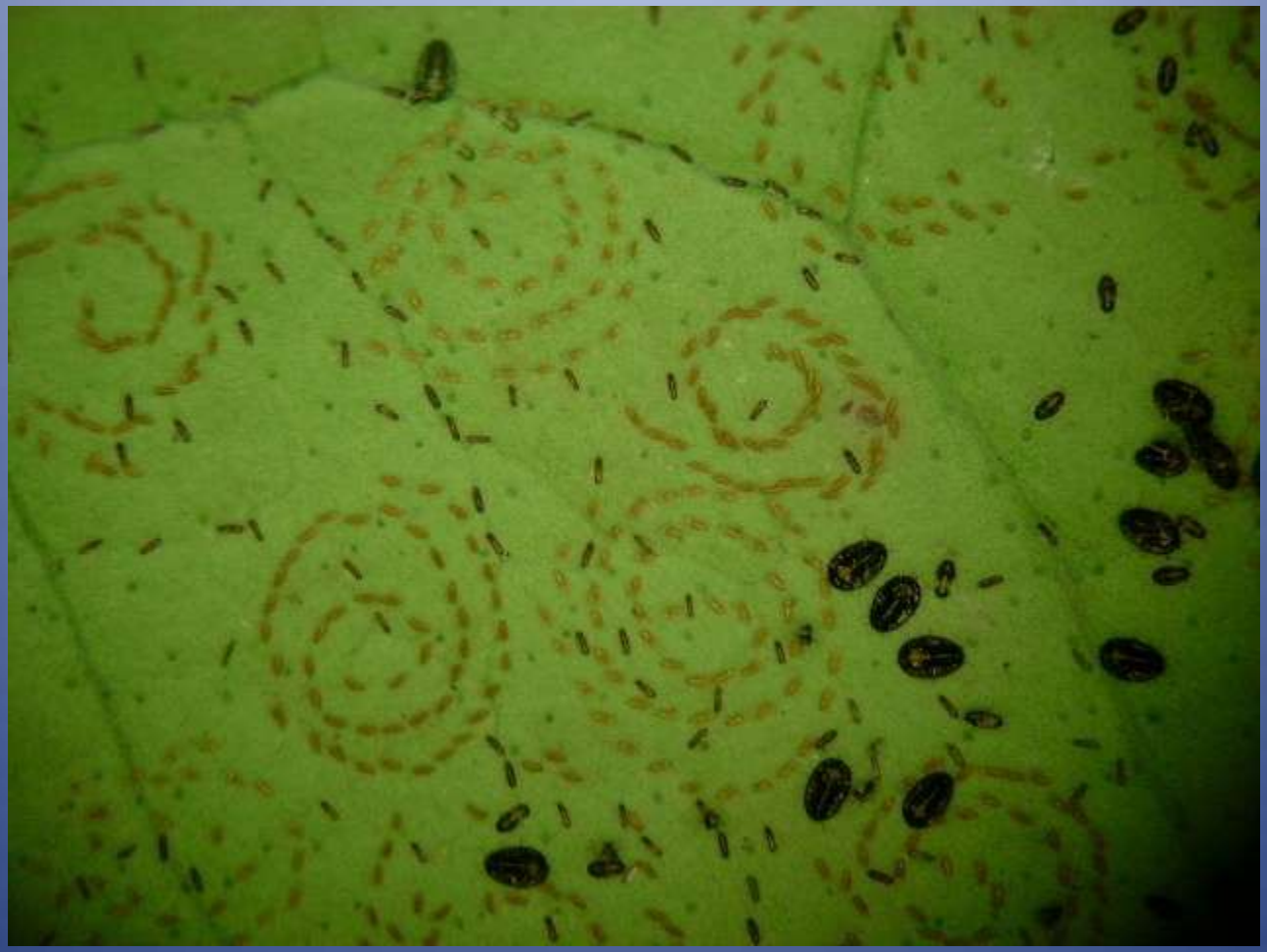


Photo: Maria Regina Vilarinho de Oliveira.

Eggs laying in spiral form of *A. woglumi*

Photo: Bárbara T. Tagliari.

Adults of *A. waglumi*

Photo: Bárbara T. Tagliari, 2008.

Aschersonia aleyrodis attacking nymphs of *A. woglumi*

Cactacea

Palm crop in Northeast Brazil

Dactilopius opuntiae (Hemiptera: Dactylopiidae)

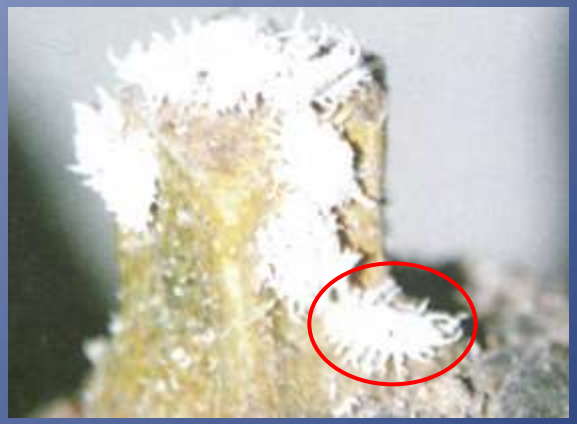
Prickly-pear-scale

Infestation of *D. opuntiae*

Predatory insect

Cryptolaemus montrouzieri **(Coleoptera: Coccinellidae)**

Adult



Larvae

Exotic Pest

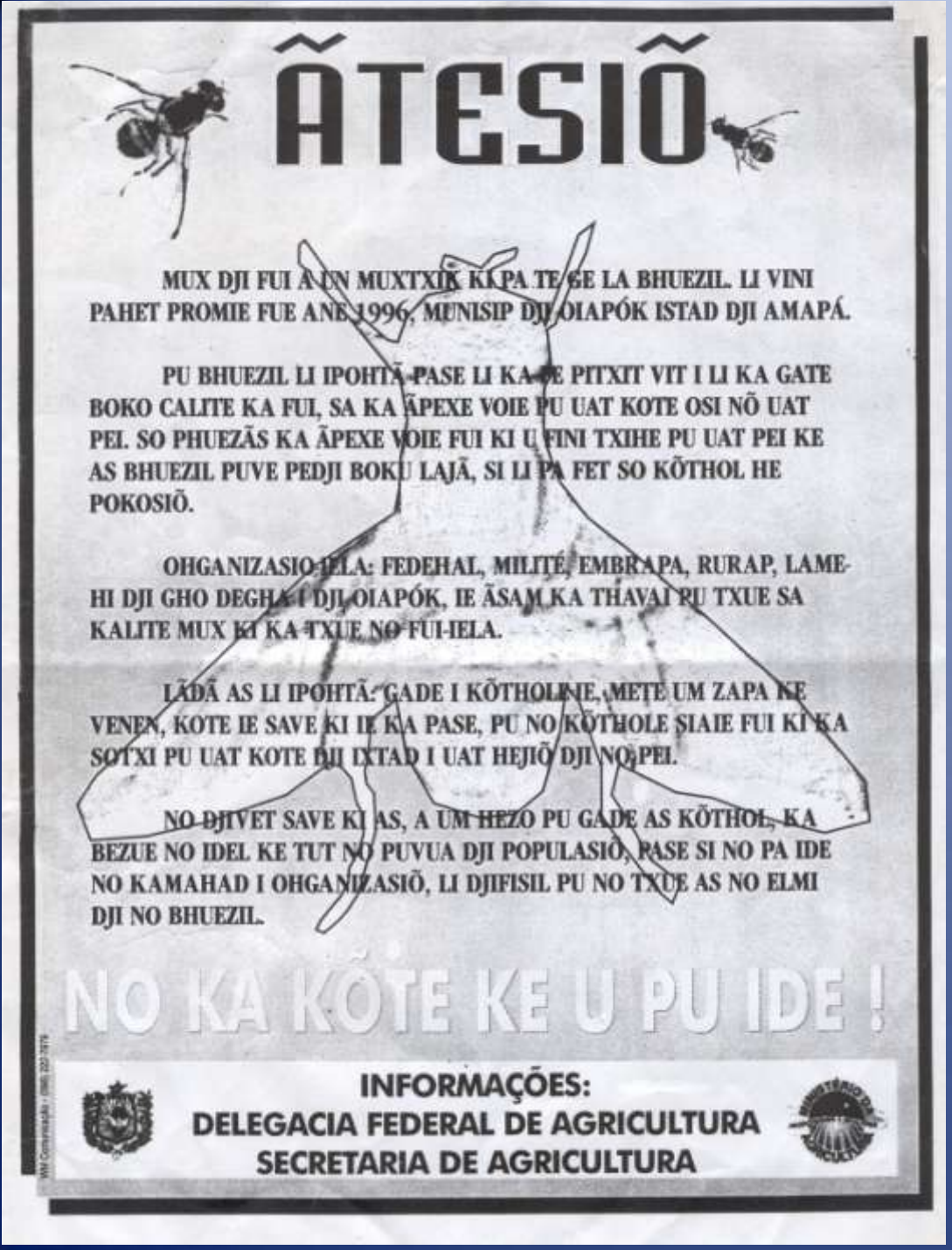
Carambola fruit fly

Bactrocera carambolae Drew & Hancock (Diptera: Tephritidae)

Adult of *B. carambolae*

Photos: Ricardo Adaime da Silva

Fruits of carambola



ÃTESIÕ

MUX DJI FUI A UN MUXTXIK KI PA TE GE LA BHUEZIL. LI VINI PAHET PROMIE FUE ANE 1996, MUNISIP DJI OIAPÓK ISTAD DJI AMAPÁ.

PU BHUEZIL LI IPOHTÃ PASE LI KA PE PITXIT VIT I LI KA GATE BOKO CALITE KA FUI, SA KA ÃPEXE VOIE PU UAT KOTE OSI NÕ UAT PEI. SO PHUEZÃS KA ÃPEXE VOIE FUI KI U FINI TXIHE PU UAT PEI KE AS BHUEZIL PUVE PEDJI BOKU LAJÃ, SI LI PA FET SO KÕTHOL HE POKOSIÕ.

OHGANIZASIO IELA: FEDEHAL, MILITÉ, EMBRAPA, RURAP, LAMEHI DJI GHO DEGHA I DJI OIAPÓK, IE ÃSAM KA THAVAI PU TXUE SA KALITE MUX KI KA TXUE NO FUI-IELA.

LÃDÃ AS LI IPOHTÃ: GADE I KÕTHOLNE, METE UM ZAPA KE VENEN, KOTE IE SAVE KI IE KA PASE, PU NO KÕTHOLE SIAIE FUI KI KA SOTXI PU UAT KOTE DJI IXTAD I UAT HEJIÕ DJI NO PEI.

NO DJIVET SAVE KI AS, A UM HEZO PU GADE AS KÕTHOL, KA BEZUE NO IDEL KE TUT NO PUVUA DJI POPULASIÕ, PASE SI NO PA IDE NO KAMAHAD I OHGANIZASIÕ, LI DJIFISIL PU NO TXUE AS NO ELMI DJI NO BHUEZIL.

NO KA KÕTE KE U PU IDE !

INFORMAÇÕES:
DELEGACIA FEDERAL DE AGRICULTURA
SECRETARIA DE AGRICULTURA

Information on *B. carambolae* in indigenous language in the north of Brazil by Brazilian Ministry of Agriculture

Exotic Parasitoid

Diachasmimorpha longicaudata **(Ashmead)**

(Hymenoptera: Braconidae)

Source: Proeta/Embrapa

Quarantine Alert

Pink hibiscus mealybug

***Maconellicoccus hirsutus* (Green)**

(Hemiptera: Pseudococcidae)

Quarantine Alert

Pink hibiscus mealybug

Maconellicoccus hirsutus

Female adult **Female/eggs** **Male adult**

Fotos: Marshall Johnson

Alerta Quarentenário

ATENÇÃO

PARA A COCHONILHA ROSADA

Colabore para evitar sua introdução no país

Qualquer suspeita de infestação comunique o Escritório mais próximo do Ministério da Agricultura e do Abastecimento ou a Embrapa Meio Ambiente Laboratório de Quarentena "Costa Lima"

Tel.: (019)867-8791 - **Fax:** (019) 867-8740
e-mail: lqcl-l@cnpma.embrapa.br

Ministério da Agricultura e do Abastecimento

Embrapa
Meio Ambiente

Alerta Quarentenário
ATENÇÃO
PARA A COCHONILHA ROSADA

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Ministério da Agricultura e do Abastecimento

Embrapa Meio Ambiente

Cochonilha Rosada
Maconellicoccus hirsutus (Green)

Ministério da Agricultura e do Abastecimento
Secretaria de Defesa Agropecuária - Departamento de Defesa e Inspeção Vegetal
Embrapa Meio Ambiente - Lab. Quarentena "Costa Lima"

Alerta Quarentenário

Esteja atento para esta praga de importância econômica que ataca fruteiras, vegetais, plantas produtoras de fibras e ornamentais e que ainda não foi constatada no Brasil.

Se você tem alguma pergunta ou deseja informar a ocorrência desta praga, por favor comunique-se com o escritório mais próximo do Ministério da Agricultura e do Abastecimento (MA) ou o Laboratório de Quarentena "Costa Lima" - Embrapa Meio Ambiente pelo
telefone: (019) 867-8791,
fax: (019) 867-8740 ou
e-mail: lqcl-l@cnpma.embrapa.br

Fotografias: Fotos 1 e 2: Dale E. Meyerdirk do USDA, APHIS; 3 - 5: Marshall W. Johnson da Universidade do Hawai.

Embrapa Meio Ambiente

Material cedido por: Dale E. Meyerdirk do United States Department of Agriculture USDA - APHIS. Tradução de F. J. Tambasco e E. A. B. De Nardo

Galho de hibisco infestado
Cochonilha rosada e massas de ovos estão concentrados nos brotos e galhos desta planta.

Broto de citros com sintoma de ataque da cochonilha
Saliva tóxica causa deformação na brotação das plantas e crescimento das folhas.

Cochonilha Rosada

Fêmea Adulta (Flecha) e fêmeas jovens: As fêmeas adultas não têm asas e têm cerca de 3 mm de comprimento; elas têm o corpo e a hemolinfa rosados.

Fêmea adulta colocando uma massa de ovos: Observa-se os ovos rosados com ninfas de 1º estágio dentro.

Macho adulto: Os machos têm um par de asas e são menores que as fêmeas. Os filamentos caudais são tão compridos quanto o corpo.

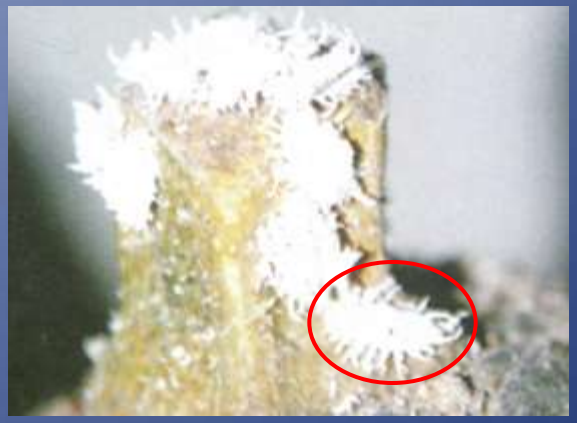
Quarantine Alert

Pink hibiscus mealybug

Biological Control Program

Predator *Cryptolaemus montrouzieri* (Coleoptera: Coccinellidae)

Adult



Larvae

Quarantine Alert

Exotic mite

Pest of rice crop

Steneotarsonemus spinki Smiley (Acari: Tarsonemidae)

Embrapa

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