



Name: Marjorie A. Hoy

Title and department: Eminent Scholar

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Education:

B.A. University of Kansas, Lawrence, 1963 Zoology (major) Entomology (minor)

M.S. University of California at Berkeley, 1966

Ph.D. University of California at Berkeley, 1972, Specializations: Insect ecology, biological control, acarology, genetics, evolution

Research Interests (with focus on Tropical Agriculture)

My research while at the University of Florida has focused on classical biological control of invasive pests of citrus. I have conducted classical biological control projects directed against the citrus leafminer, the Asian citrus psyllid and the brown citrus aphid, which has involved foreign exploration, evaluation of the natural enemies in quarantine, writing of an environmental assessment prior to obtaining permission to release the natural enemies, developing rearing methods, making releases and evaluating establishment and spread.

Recently, I have begun a classical biological control project on the red palm mite, an invasive pest in the Caribbean and, now, in Florida. I traveled to Mauritius in September 2007 to obtain predatory mites that are now being reared in quarantine for evaluation.

In addition, we have developed a molecular method for assessing the risks of introducing a parasitoid of the Asian citrus psyllid that was contaminated with a citrus disease (greening), which allowed us to quantify the risk by quantifying the sensitivity of the test.

We recently completed the first complete survey of the microbial symbionts of a predatory mite and its prey, the two-spotted spider mite to resolve which, if any, they shared. Both predator and prey share the same strain of *Wolbachia*, which is consistent with horizontal transfer. The diversity of microbial symbionts discovered in both predator and prey was greater than previously known.

We have developed several molecular methods to identify biotypes or cryptic species of natural enemies used in biological control programs and to monitor establishment and spread of natural enemies.

5 most significant publications relevant to tropical agriculture

Hoy, M.A. and A. Jeyaprakash. 2005. Microbial diversity in the predatory mite *Metaseiulus occidentalis* (Acari: Phytoseiidae) and its prey, *Tetranychus urticae* (Acari: Tetranychidae). *Biological Control* 32: 427-441.

Hoy, M. A. 2003. *Insect Molecular Genetics*, Second Edition, Academic Press/Elsevier, San Diego, CA, 560pp.

Hoy, M. A., A. Jeyaprakash, and R. Nguyen. 2001. Long PCR is a sensitive method for detecting *Liberobacter asiaticum* in parasitoids undergoing risk assessment in quarantine. *Biological Control* 22: 278-287.

Hoy, M. A., A. Jeyaprakash, and R. Nguyen. 2001. Long PCR is a sensitive method for detecting *Liberobacter asiaticum* in parasitoids undergoing risk assessment in quarantine. *Biological Control* 22: 278-287.

Hoy, M. A. 2000. Deploying transgenic arthropods in pest management programs: Risks and realities. pp. 335-367. In: A.M. Handler and A. A. James, Eds. *Insect Transgenesis. Methods and Applications*, CRC Press, Boca Raton.

Extramural support during past 5 years

2007-2009	\$104,000	Florida Citrus Production Research and Advisory (FCPRAC-FDACS)	Improved Control of Psyllid with Silwet L-77 and Reduced Rates of Insecticides
2007-2009	\$74,800	USDA-APHIS	Classical Biological Control of Red Palm Mite
2006-2007	\$5000	University of Florida-IPM	Control of Asian Citrus Psyllid With Silwet L-77
2006-2007	\$500	International Programs-UF	Classical Biological Control of the Brown Citrus Aphid in Dominica
2004 - 2007	\$96,830	U S DEPT OF AGRICULTURE	Integration Of Chemical And Biological Control Of The Citrus Leafminer In Young Groves
2003 - 2005	\$35,000	U S DEPT OF AGRICULTURE	Classical Biological Control Of The Brown Citrus Aphid In Florida
2003 - 2004	\$32,000	DEPT OF AGRICUL & CONSUMER SER	Classical Biological Control Of Citrus Psylla & Pink Mealybug
2002 - 2004	\$35,000	U S DEPT OF AGRICULTURE	Classical Biological Control Of The Brown Citrus Aphid In Florida
2002 - 2003	\$20,000	DEPT OF AGRICUL & CONSUMER SER	Classical Biological Control Of The Brown Citrus Aphid
2002 - 2003	\$30,000	DEPT OF AGRICUL & CONSUMER SER	Classical Biological Control Of Citrus Psylla & Pink Mealybug
2001 - 2003	\$35,000	U S DEPT OF AGRICULTURE	Classical Biological Control Of The Brown Citrus Aphid In Florida
2001 - 2002	\$33,000	DEPT OF AGRICUL & CONSUMER SER	Classical Biological Control Of Citrus Psylla And Pink Mealy Bug

Teaching Interests (with focus on Tropical Agriculture)

Narrative: I teach 2 courses: one on Insect Molecular Genetics and one on Agricultural Acarology.

My acarology course is organized to focus on using various control tactics to control pest mites, including classical biological control, augmentative biological control, host plant resistance, chemical control, with a focus on pesticide selectivity, so that natural enemies are preserved. I provide case studies as models that exemplify the different combinations of tactics used in crops such as citrus (Florida and California), cassava (cassava green mite), as well as ornamental and horticultural crops.

Extension/Outreach Interests (with focus on Tropical Agriculture)

Narrative: I do not have an Extension component to my assignment.

International Activities (with focus on Tropical Agriculture)

Narrative: ½ Below is a description of my efforts during the past 5 years. I have also conducted field work in

Thailand, Taiwan, Japan, Australia, and Benin in the past, primarily on biological control of citrus pests, although the work in Benin was on cassava green mite.

Three invited lectures in Korea: Genetic Improvement of Arthropod Natural Enemies, presented at Seoul National University and at Andong National University; also presented a talk on Classical Biological Control for graduate students in the Department of Entomology, Andong National University, February 2007. Travel funding provided by Andong and Seoul National Universities.

Lecture on "Classical Biological Control of Red Palm Mite", presented to staff at the Ministry of Agroindustry, October 2007, Mauritius.

Lecture on "Classical Biological Control of Brown Citrus Aphid", presented to staff of the Ministry of Agriculture, Fisheries and Forestry, Dominica, April 2007.

Invited lecture, "Classical Biological Control of Invasive Pests in Florida's Citrus: The Impact of Canker and Greening", IOBC Conference on IPM in Citrus, Catania, Sicily, Nov. 2007

Entomopathogenic fungi infecting the Asian citrus psyllid, *Diaphorina citri*, in Florida, Poster presented by J. Meyer, M. Hoy, D. Hall and D.G. Boucias at the 41st Annual Meeting of the Invertebrate Pathology Society, 01/01/2007, University of Warwick, Coventry, UK.

Classical biological control of citrus pests in Florida and the Caribbean: Interconnections and sustainability, Caribbean Food Crops Society, 42nd Annual Meeting, San Juan, Puerto Rico, July 2006.

Invited Symposium talk, "Classical Biological Control of Citrus Pests in Florida and the Caribbean: Interconnections and Sustainability", at the International Workshop on Biological Control, Davos, Switzerland, September 2005.

Organized symposium for 7th International Society for Biosafety Research Meeting, on the Biosafety of Genetically Modified Organisms, presented talk, "Analysis of Risks of Transgenic Insects for Pest Management: Past and Future Guidelines". Also presented a poster on the same topic, October 2002, Beijing, China. Prepared meeting report on transgenic insects, published in the journal *Environmental Biosafety Research*.

FAO/IAEA meeting on "Status and Risk Assessment of the Use of Transgenic Arthropods in Plant Protection", Presented invited talk, "Risk Assessment and Transgenic Arthropods"; Served as Working Group Chair, "Development of Risk Assessment Protocols". Rome, April 8-12, 2002

Beijing, China, October 9-18, 2002, Organized symposium on Transgenic Insects, presented talk, "Analysis of 200 Risks of Transgenic Insects for Pest Management: Past and Future Guidelines". Also presented a poster on the same topic. Prepared meeting report to be published in the new journal, *Environmental Biosafety Research*, of which I am an editorial board member.

Served on USDA-APHIS Technical Advisory Committee for the Red Palm Mite since 2007. Served as advisor on biological control, provided input into Plan of Work, and other efforts to mitigate against this invasive pest.

Consulted with the Ministry of Agriculture, Fisheries and Forestry on biological control of the brown citrus aphid in Dominica. Evaluated damage caused by red palm mite during a field trip in April 2007.

Provided information on the Asian citrus psyllid to Nery Hernandez in Cuba.

Consultant to CARDI (Caribbean Agricultural Research and Development Institute), regarding biological control of brown citrus aphid in Jamaica. Traveled to Jamaica, lectured, met with Jamaican and CARDI authorities to provide information on classical biological control. Provided a parasitoid for release in Jamaica, 2004-2006.

Developed a White Paper on Transgenic Arthropods for the Pew Charitable Trust and assisted the Pew Charitable Trust Initiative on Food and Biotechnology in organizing an international conference on transgenic arthropods; participated in conference as a speaker, 2004-2005.

Consultant to the Pew Charitable Trust Initiative on Food and Biotechnology; wrote a white paper for them on "Transgenic Arthropods", which was subsequently used as the basis for the publication *Bugs in the System? Issues in the Science and Regulation of Genetically Modified Insects*, published in 2004 in Washington, DC (109 pp).

Provided information to Bermuda Department of Agriculture on biological control of citrus leafminers, brown citrus aphids, and pink hibiscus mealybugs. Traveled to Bermuda twice to lecture, evaluate, and provide assistance, 2000-2003.

Presented a talk "Transgenic Insects for Pest Management Programs: Potential Risks", at the "Workshop on Defining Science-Based Concerns Associated with Animal Biotechnology", organized by the Division on Earth and Life Studies, Board on Agriculture and Natural Resources, National Academy of Sciences, November 1, Washington, D.C.